

16456

Eastern Belt  
Port Jervis to  
Albany, N.Y.

July - Sept. 1938

Franklin &  
13



0-28 - Windsor to  
Lynn Vitulina  
28-42 Floor of old  
quarry - last  
Hamilton seen  
at about 34.

Summit Hill

about 40-45' above  
Qy.

$$\begin{array}{r} 42 \\ 210 \\ 18 \\ \hline 228 \end{array}$$







which maps have been published. Over 3,300 quadrangles in the United States have been surveyed, and maps of similar to the one on the other side of this sheet have been published.

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THE DIRECTOR,

*United States Geological Survey,  
Washington,*

September, 1928.



5/3  
11/23/5  
Southern  
H. began

7645  
107  
63  
Thickness = 2600'

Port.

Aug 27<sup>3</sup>

1567



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly inclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes

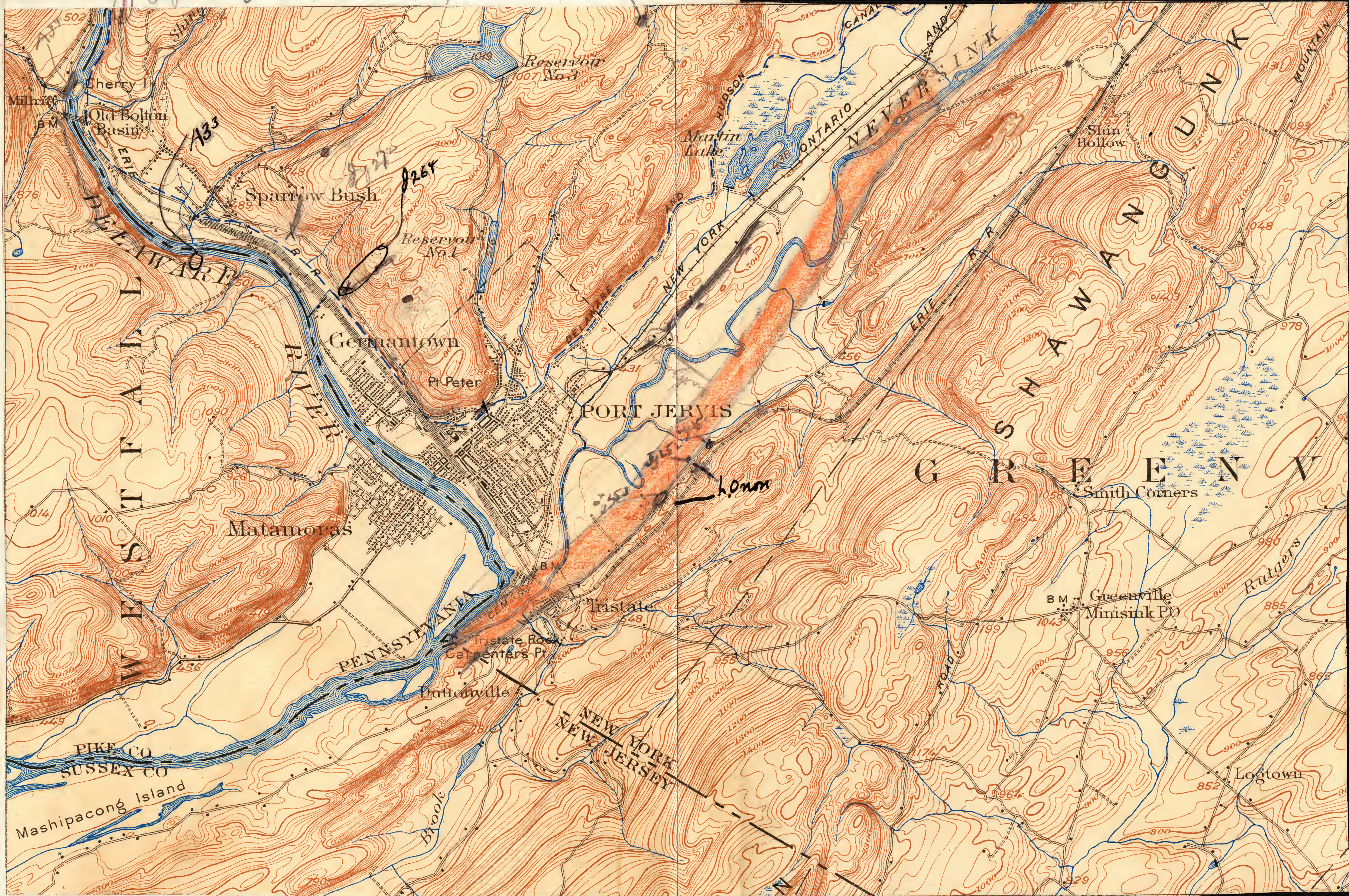


500  
1215  
begin

Thickens = 2600'

Port.

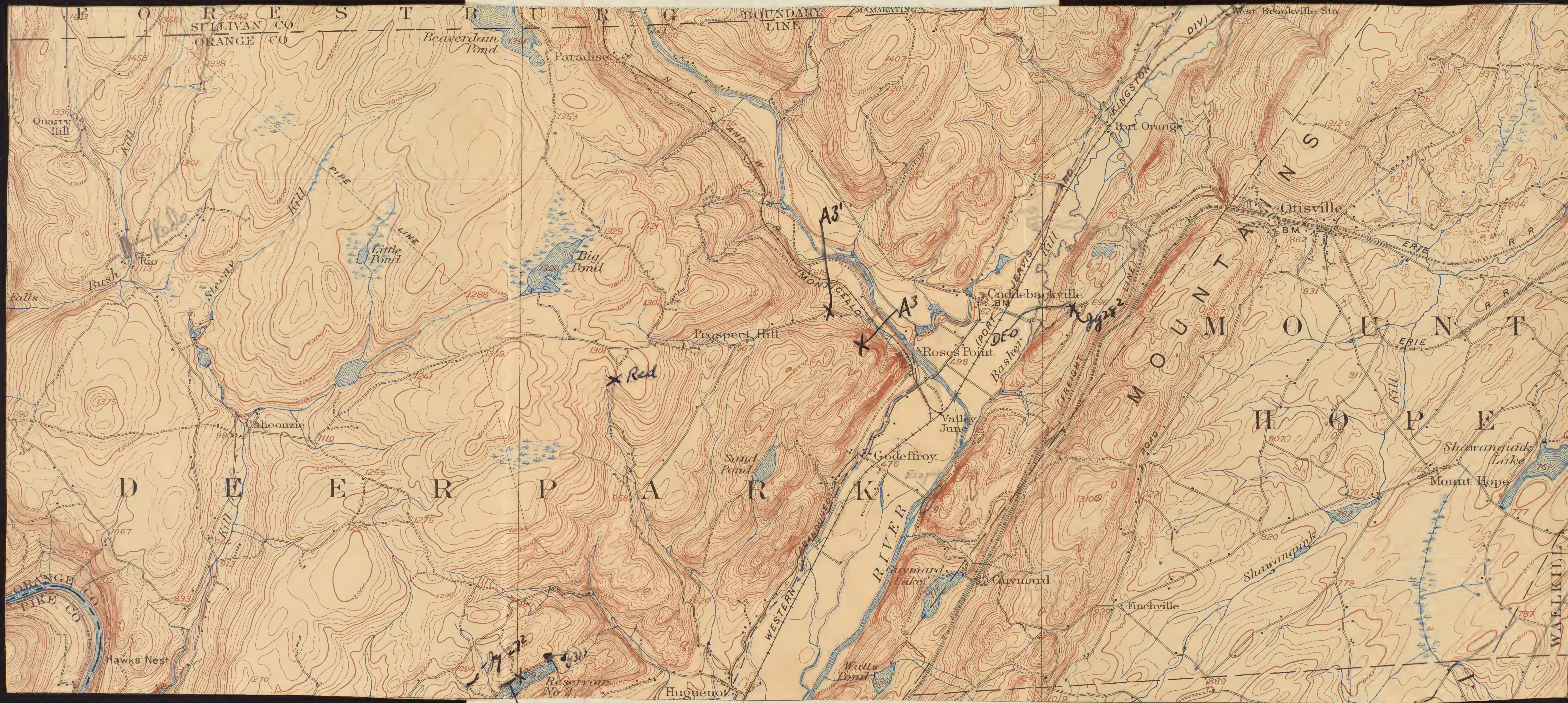
July 27<sup>3</sup>











Jy 31 22



1568

## THE TOP

The United States Geological Survey is making a standard topographic atlas of the United States. This work has been in progress since 1882, and its results consist of published maps of more than 40 per cent of the country, exclusive of outlying possessions.

This topographic atlas is published in the form of maps on sheets measuring about 16½ by 20 inches. Under the standard plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for any quadrangle depending on its extent and its probable future development, and consequently though the standard atlas sheets are of nearly uniform size they represent areas of different sizes. On the lower margin of each sheet are printed graphic scales showing distances in feet, meters, and miles. In addition, the scale of the map is shown by a representative fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale  $\frac{1}{62,500}$  means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 similar units on the earth's surface.

The standard scales used on these maps are multiples of the fraction  $\frac{1}{62,500}$ . Quadrangles in thickly settled or industrially important regions are mapped on a scale of  $\frac{1}{25,000}$  or

59 8  
567  
069

1000  
1000  
1000



## TATES

usually away and forms an inclined table-land that is crossed by a few shallow gullies. On the map each of these areas is represented, directly beneath its position in nature, by contour lines.

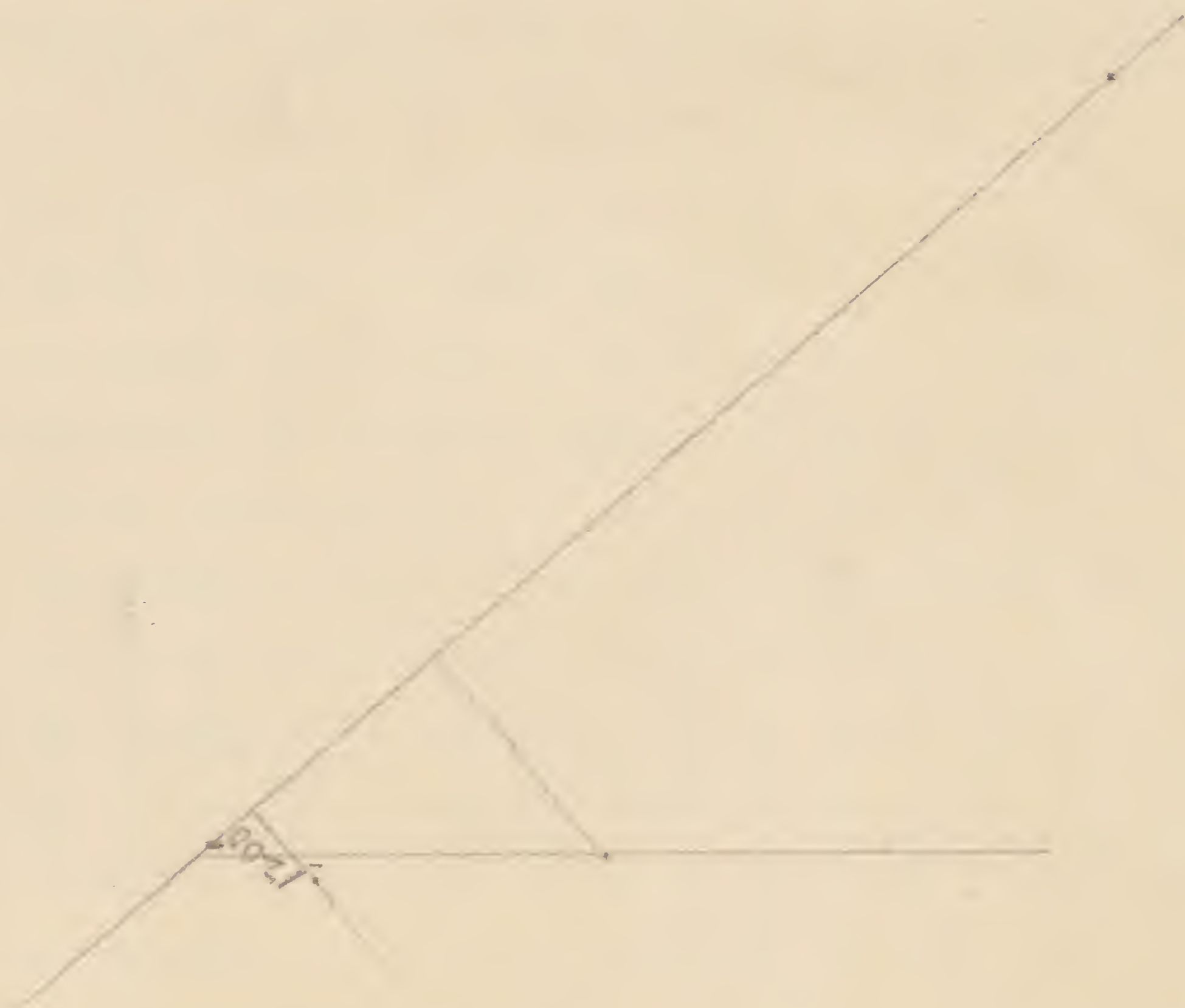
The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the area mapped; in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 250 feet. Certain contour lines, every fourth or fifth one, are made heavier than the others and are accompanied by figures showing altitudes. These figures are the heights of many points—such as road corners, summits of peaks of lakes, and bench marks—are also given on the map. These figures, which show altitudes to the nearest foot only. Most of the altitudes—those of bench marks—as well as the geodetic altitudes of triangulation stations, are published in bulletins and are issued free by the Geological Survey.

The lettering and works of man are shown in black. Boundaries, such as those of a State, county, city, land grant, reservation, or reservation, are shown by continuous or broken lines of different kinds and weights. Metalled roads are shown by double lines, one of which is accentuated. Other roads are shown by fine double lines, private and poor roads by dashed double lines, trails by dashed single lines.



59 8  
57 1  
069

2201  
2257  
2257  
2257



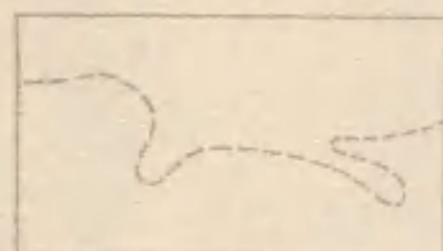
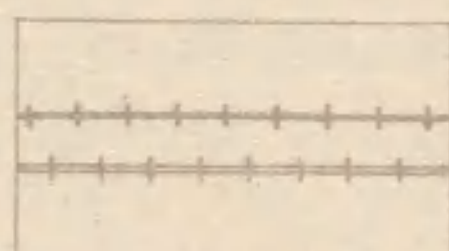
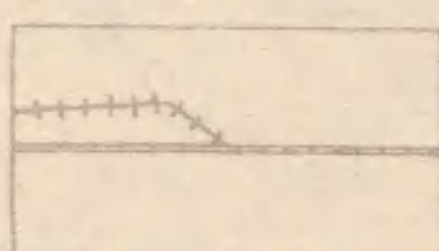
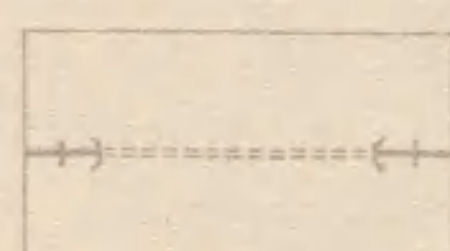
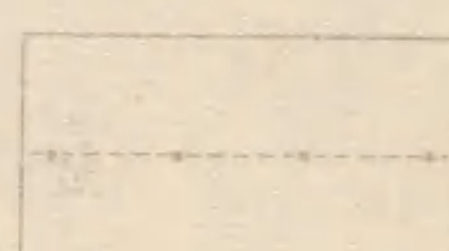
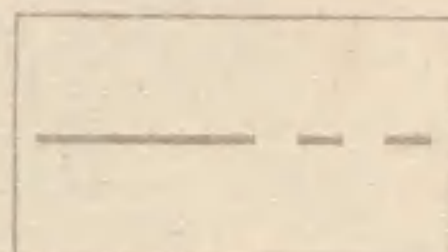
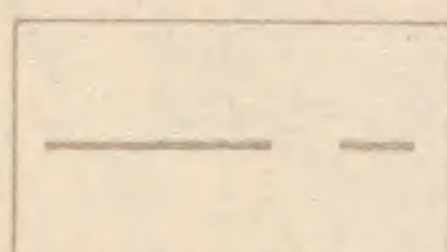
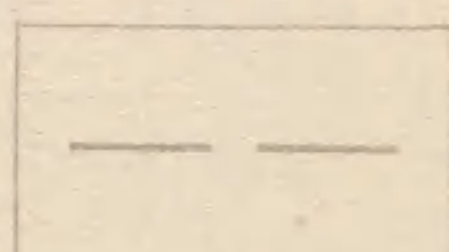
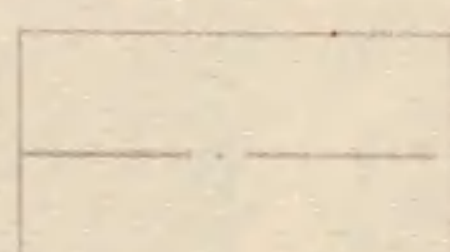
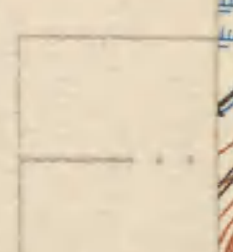

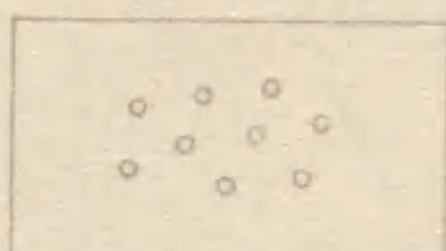






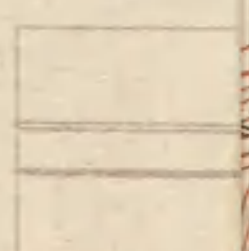


enclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping

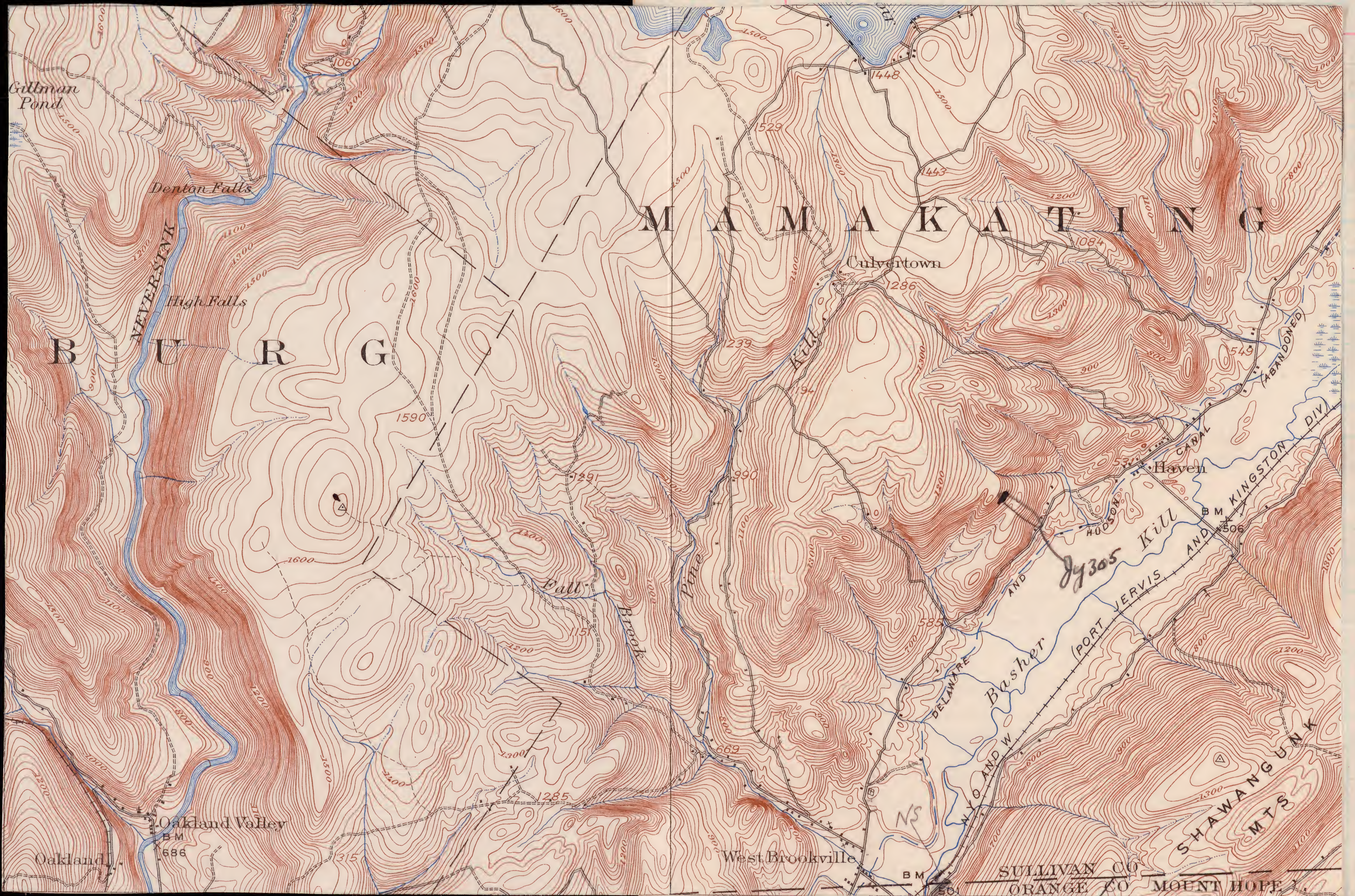
1569

## STANDARD SYMBOLS

### CULTURE (printed in black)

				
Trail	Railroads	Electric railroad	Tunnel	Power-transmission line
				
State line	County line	Civil Township or district line	Reservation line	Land
				
Tanks and oil reservoirs	Oil and gas wells	Mine or quarry	Prospect	Sand
				
Streams	Falls and rapids	Intermittent streams and ditches	Canals and ditches	





new Sept 1901



the map are printed the names of adjoining quadrangles which maps have been published. Over 2,800 quadrangles the United States have been surveyed, and maps of similar to the one on the other side of this sheet have published.

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Washington, D. C.

November, 1919.

4.35  
36  
—  
75

120  
100  
180  
250  
—  
670

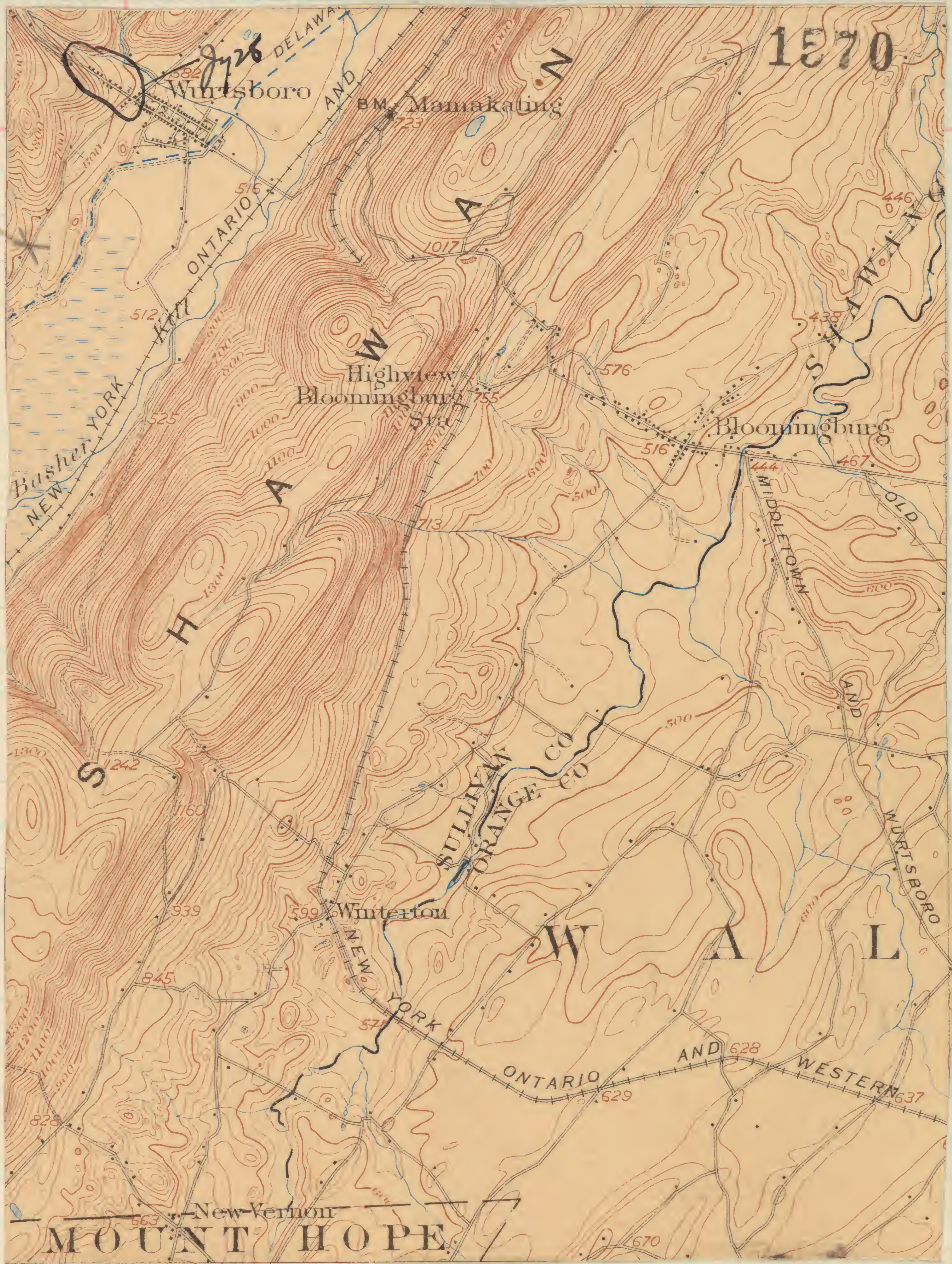




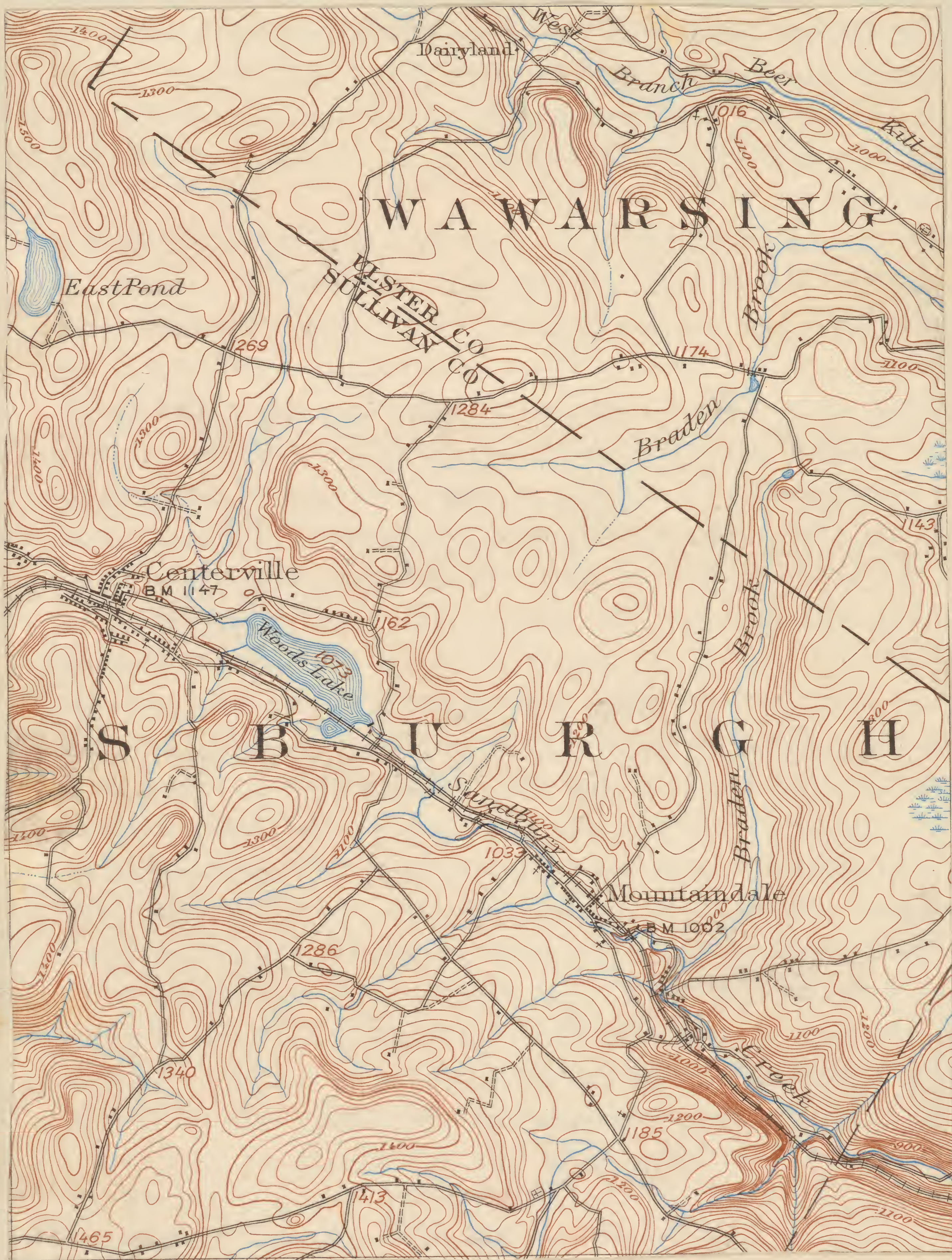
175  
100  
150  
250  
575



84384









1570a

The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly enclosed by a hooked sand bar. On each side of the valley terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping









ing spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined table-land that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

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Washington, D. C.

September, 1928.



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Port Jervis

May 23, 1936

1571

①

Visited beds in railroad cut  
between Mullin's hotel and  
the bridge over Delaware.

Heavy bedded sand and arenaceous,  
dark and green shales. One  
thick storm roller bed as fine  
as I have ever seen. Fossils are

common, particularly on the  
underside of slabs of sandstone

Paracyclus Camerotoechia

Actinoptera Spirifer

Cypreandella Leiodon

The fossils could be Hamilton or  
higher.

Belongs to  
Tremont Rock

May 23, 1936

Carpenter's point on peninsula  
forming Port Jervis Cemetery  
anticrop of Onondaga, probably  
close to top. Strike N43°E 130°N.





May 24

1572

(2)

Measured 15° dip but  
Mr. C. says 33°. May  
be a steepening of  
dip NE along strike  
narrowing valley in this direction

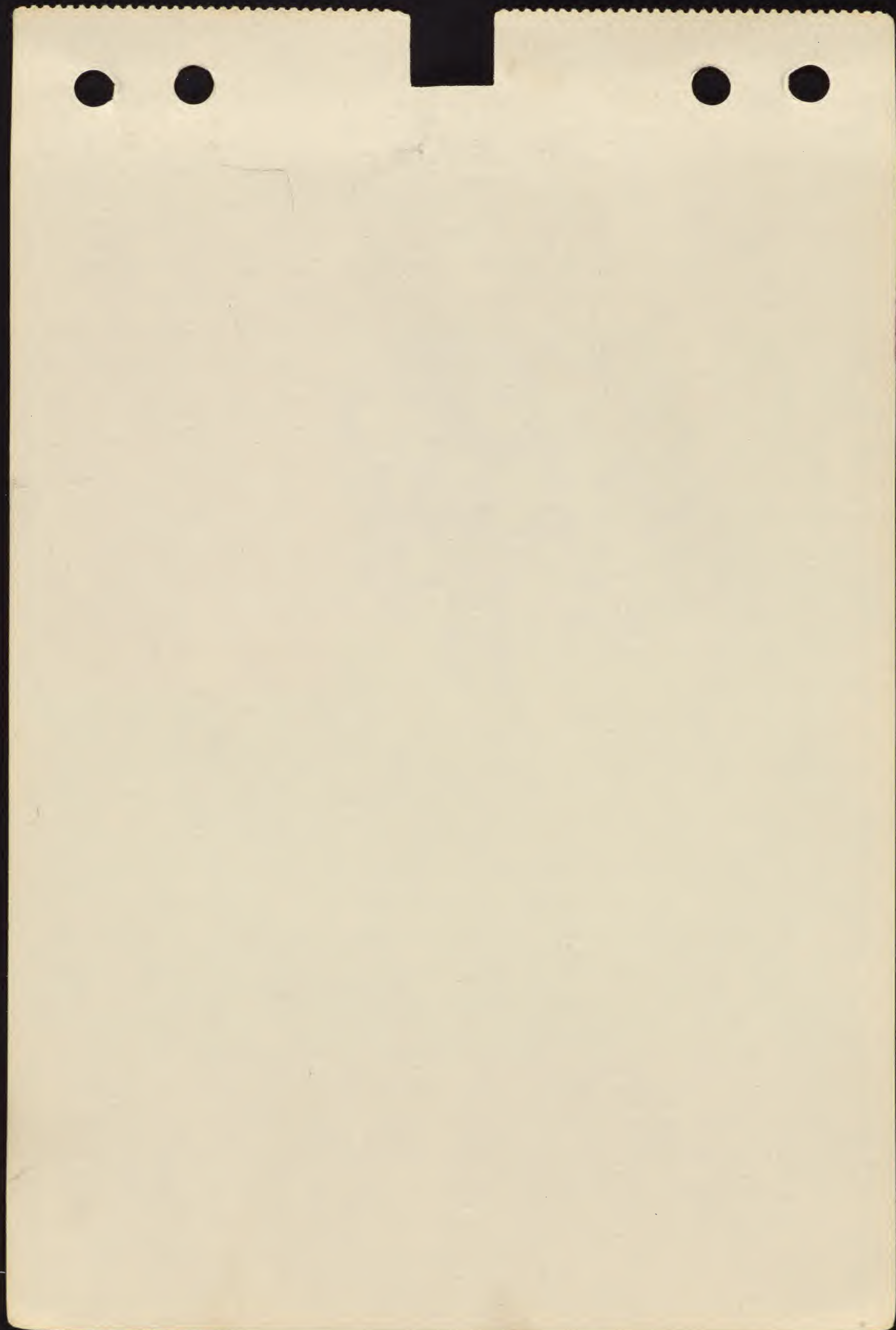
Exposures along SE side highway  
No. 209 ~~about~~ 1-2 miles from city line  
Coarse arenaceous mudstone  
strongly cleaved, cleavage 60°+ to  
SE. Strike N 43° E, 33° NW. Only  
fossils seen are Ceratopora, which  
Mr. Chadwick says are ~~characteristic~~  
~~of the~~ the only fossils found in  
the lower part of the Mount  
Marion.

MPC. says see road Catskill to Great Falls  
of Katerskill, about 1 1/2 - 2 miles NNE of Falls  
Wesley Hawk Farm (yellow locust trees), follow  
brook and near base of hill is a cascade  
& shoft in black shales.

May 24'

Onondaga dipping east.







Mileage on drive in Elko PK

15733

90.09  
90.65 -

90.95 - 1st strong bend 0.3

91.09 - starfish bed. 0.14

91.20 - left loop.

91.36 - Tropidoleptus

91.58 - fork to Hwy-drive (Camp Road)

91.64 - Vitulina

92.00 Summit

92.10 Bend

92.18 "

92.32 "

92.40 "

92.50 - " fossils

92.68 ditch

93.25 - fork to Pt. Peter.

2.66



May 24<sup>th</sup>

1574

Exposures of 30' or more of  
fine arenaceous shale which  
crumbles to thin, small lumps.  
Dark colored but with white streaks.  
No fossils seen. These over May 24<sup>th</sup>

M 24<sup>3</sup>

Long exposure of fine + lumpy  
arenaceous mudstone, no storm-  
roller, no cross-bedded ss. Saw  
*Nyassa*, *Grammysia* + large *Spirifer*.  
Dip 37-45° N 50-60° W.

M. 24<sup>4</sup>

There is an excellent section  
along the road up to St. Peter  
in the new park. The beds  
revealed vary in lithology but  
all are predominantly sandy.  
There are many storm-roller  
beds. About 0.44 mile from  
beginning of road is a layer  
a foot or less in thickness  
containing large *Spirifers*,  
*Rhipidomella*, *D. bronaster*,  
*P. flabellum*, *Grammysia*  
*cinstrita*, *Cimitaria elongata*,  
*Pal. cinstrita*, *P. emarginata*.  
Below this bed an occasional  
*S. alveata* and *Nyassa* were



found.

1575

(5)

At 0.71 miles were found *Tropidoleptus* and *Leptostrophia*

At 0.99 a hard sandy (calcareous?) layer abounding in *Vatulina* was found. This lies under the new power line I am not sure if the section to *Vatulina* is just Skaneateles or Skaneateles & Dundlowville.

sandy The ditch up the south-east face of the hill exposes mud-stone all the way up the lower part being fine-grained but the upper  $\frac{1}{2}$  at least being coarse and breaking into heavy lumps. Fossils are rare, also *Pholidomella* and *Nephritina* *puccin*.



May 25

1576

(6)

Lower entrance to ditch is at  
0.2 mile from canon (A).

N 15° E - 34'

Lower 5' at bottom of ditch is  
coarse lumpy sandy mudstone

N 33° E - 76'

From 5' - 25' covered

25' - 35' - arenaceous mudstone

35' - 76' - covered.

N 5° E - 136'

76' - 131'

Sandy lumpy mudstone breaking  
into rather heavy blocks.

N 20° W - 239

At 146 - *Cyrtocella*, *O. constricta*, *E. rugulata*

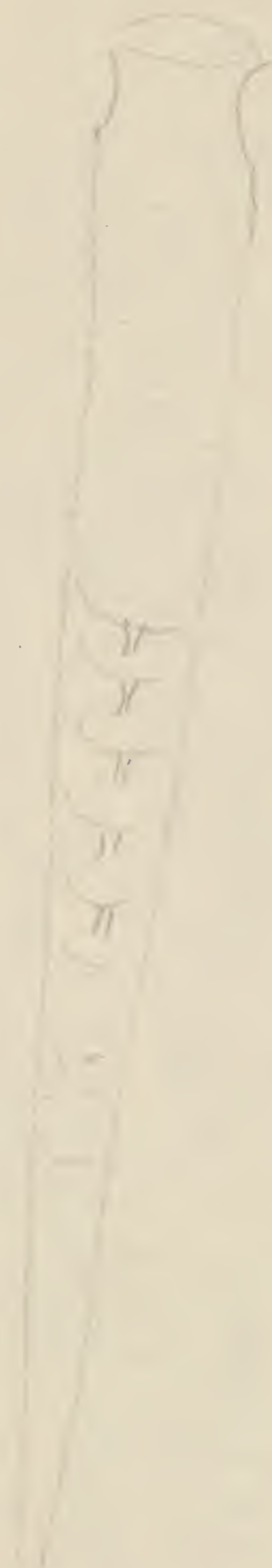
at 184 - *Myasao arguta*

~~221~~ 221 - 226 covered

At 221a 1' heavy, hard  
bed N 45° E 15° NW.

The rock in this interval  
is coarse heavy-bedded  
sandy mudstone or shaly  
as, breaks into thick irregular





*Orthoceras*



lumps. Saw sp. granulosus  
and Athyris.

1577

(7)

N 3° E - 368'

239-245 - very hard ledge  
coarse irregularly fracturing ss.

245-279 - ss. fine grained  
shaly, massive at base becoming  
massive, irregular fracture very  
hard at top.

*Myasoa arguta*, *P. flabellum*

279-303' Very heavy, irregularly  
fracturing shaly ss, hard, breaks  
into big lumps.

A piniceps

303-368' Lower 15' shaly  
hackly ss. upper part coarse  
heavy, lumpy ss. End

368-380' intersection of  
sky-line drive and picnic grove  
This is the general level of the  
grove

Fossils from upper part of  
ditch -

*Leiopteria*

15+3

278

380



M 25'

1578 (2)

Sloping dip face just about  
60-100 yds NW of flag pole on  
Pt. Peter. Hackly, shaly ss.  
with

<i>M. arguta</i> c	<i>Leptæna</i>
<i>P. flabellum</i> c	<i>Athyris</i>
<i>Spiner andaculus</i> = n. sp.	
<i>Sp. mucronatus</i>	<i>A. princeps</i>
<i>Camantochia</i>	<i>Productella</i>
<i>Aviculapecten</i>	<i>H. deKayi</i>
<i>Sp. andaculus</i>	
<i>P. lirata</i> a.	
<i>M. concentrica</i>	

~~Located on NW side of road  
taking out going traffic~~

Pt. Peter forms 3 beads on  
map, 1st is point Peter, 2nd  
is outcrop above described;  
ditch comes into 3rd.

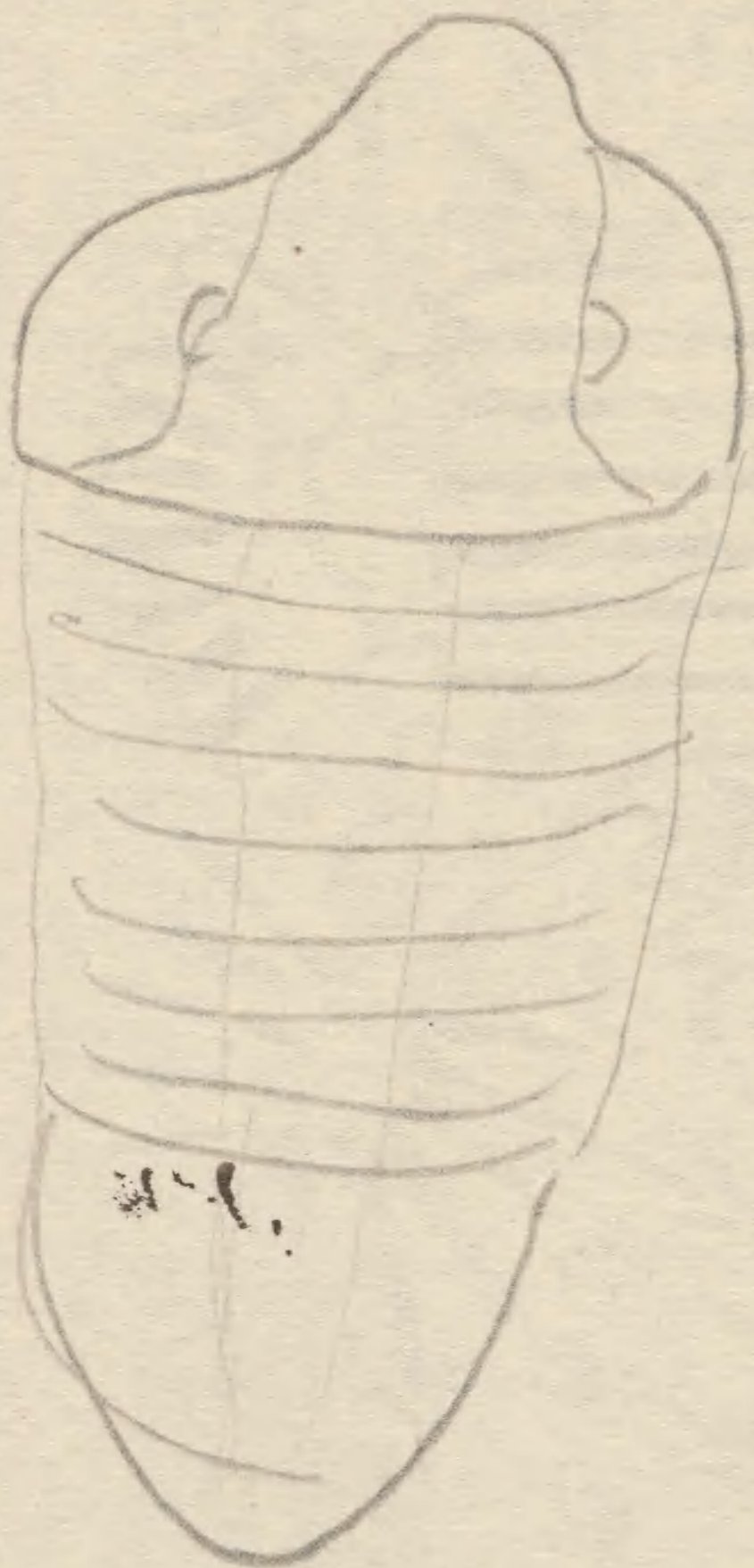
M 25' located on NW side of  
exit road from Pt. Peter  
and at intersection of Pt. Peter rd  
& exit rd.

(Exp with Nyassa  
Pt P)

Ditch & Pt. Peter all Marcelino  
I think.

Send Mr. Plouffe plastercast of Diploma







At <sup>N</sup> end of Pt. Peter Paracyclas  
Limoptera (small), D. dekeyi (9)

1579

Hill behind (just N) of  
camp contains blue argillaceous  
sandstones with Rhipidomella  
They strongly suggest Moscow

Vitulina ledge 5-6' thick  
More probably 2-3'.

May 26

0.32 mile SE of stream (1 mile  
SE of Sparrow Bush (marked V))  
great block with coquina of  
Sp. granulosa, suggests twigs talpish  
bed.

MM'



1580

10

July 19.

Stop 1.

Chestnut ridge of Little Gap on  
Mauch Chunk Quad. Fault on  
north side ridge along road  
shows Onondaga at base (few feet)  
overlain by Marcellus. South  
comes conglomerate & coarse ss.  
of Esopus faulted against Marcellus.  
See B. L. Miller on Mineral  
Fragments for structure at  
Palmerton

Stop 2

Lehigh

Bowmantown -  $\frac{1}{4}$  mile S of  
RR Station Onondaga overturned  
to N lies on Marcellus with  
Bucania. 275 paces north of  
RR Sta. appears coral bed  
about 35' or more thick  
containing Elythra, Phacops  
Dichotella & others. Hamilton  
continues N to his Hollow  
where a sandstone 10' comes  
in. Just below the ss about  
3-5' comes Rhipidomella, Athysa  
and Atrypa. Suggests upper  
zone of Hamilton (Spinifer Atrypa  
zone)



1581

11

Stop 3

On U.S. Hwy 309 about 500 paces  
N of Bowmansport Sta on C. R.R.  
N. G. about 20' Gully with Hypo.  
+ *Echinocoelia* N 89° W 47° N

Stop 4

Across River from Weisport to  
Lehighton on S side Lehighton  
at old bridgehead - Coral bed  
= Centerfield

July 20.

Stop 1

Onondaga on Tempewy 209 (Pa 402)  
about 2 1/2 East of East Stroudsburg.

Stop 2

On Erie (N.Y.S. & W.R.R.) at Water Gap Sta.

Stop 3

US 611 over Godfrey Ridge just  
South of Stroudsburg. Excellent  
exposure of Esopus about 1/4 mile  
NW of Fox Town Gap. Contains  
*Leptocoelia* about 25' below  
top of Esopus. Onondaga exposed  
at base of hill. Beds on slope  
of hill dip steeply north.  
Nearly flat on top of hill.



1582/12

Stop 4

Quarry on King St. on north edge of Stroudsburg. Marcellus dark gray shale about 40' thick. Band with Ambocoelia about 15' or 20' up. L. limitane a.

Stop 5

Coral bed - On Pa 2 miles N of Stroudsburg

A - Dark blue calc. ss. with a few scattered corals, Sp. venustus, L. gibbosa, Elythra, L. perplana etc.

B - 10-12' - dark gray calcareous ss abundant in corals.

Cystiphyllum la, Helophyllum

Favosites, digitate Favosites

B Cyathophylloids Large corals

A are most abundant in the lower 4' of bed B. also upper 6-8', smaller corals are prevalent & invertebrates common. Sp. venustus occurs. than B.

C. 5' sandy stone few corals many inverts.

5' few corals

10-12' lining ss full of digitate + other corals

6' blue calc. ss. fossils c. corals few

Blue ss fossils rare



1583 (13)

Stop 6 Fully Junction 190 + 90, 3 mi.  
N of Stroadsburg, Broadhead  
Creek Valley. All thicknesses agree.

5'	}	E	A — Hamilton dark shale with <i>Vitulina</i>
10'		D	B. Dark shaly ss. breaking with elongate fracture, <i>Hypothyris</i> rare, <i>Leiorhynchus</i> , <i>Rhynchonella</i> , <i>Echinocochia</i> in upper 10-20'
Covered 20' ± C			
40'	}	B	C. — D. — 10' hard sandstone with <i>Camerozoechia</i> , <i>Rhynchonella</i> , <i>Tropidoleptus</i> , <i>Hypothyris</i>
10'?		A	E. Shaly fracturing ss with <i>Emmella affinis</i> , <i>Leiorhynchus</i> , <i>Hyp.</i> , <i>Echinocochia</i> , <i>Leiorhynchus</i>

N 86 E 22° N.



1584

July 22

Section along Hy N.Y. 42, 97 (Park Ave.)  
 Section begins at fork of river  
 road (West Main Street and Park  
 Ave.: Lowest exposed bed of hard  
 sandstone with irregular fracture  
 dark blue gray in color. Strike  
 $N 59^{\circ} E 15^{\circ} NW$ . No fossils seen. This  
 road intersection is 550 paces from  
 traffic light where Hy 209 goes east

This lower ledge makes uppermost  
 ledge of bluff under Pt. Peter, Hy. goes  
 from junction with West Main.  $N 72^{\circ} W$

46 paces from junction rock becomes  
 softer shaly sandstone breaking into  
 irregular ~~chunks~~ chips + fractured into  
 irregular lumps. This rock which  
 looks much like the Peckport  
 continues to 164. Small clasts. Small concretions

164 - 238. Very massive, very  
 dark gray, heavy bedded, lumpy ss.  
*G. alveata?*

238 - 260 - Finer grained sandstone  
 breaking into small fragments.  $\frac{1}{2}$   
 concretion band on top.

260 - 276 Slighted high top  $55^{\circ} E$  + Edge  
 of hill just S of P.T.  $570^{\circ} W$ . Thin bedded  
 bluish gray ss. red iron-rust breaking  
 into thin flat plates.

276 - 314 - Similar thin-bedded dark  
 blue gray shaly ss. with shaly  
 fracture. Road turns to  $N 15^{\circ} W$  where



1585

(15)

Just over  
bridge over R.R.

314-435- Very massive little fracture dark gray ss. like that below thin-bedded ss. Thin bed at top containing *Athyris*; *Chonetes mucronatus*! Sandstone becomes gradually coarser + harder to top. About 6" below *Athyris* bed *Rhipidomella* is common.

435-535- hard shaly sandstone breaking into moderate-sized lumps dark blue gray in color. Above this and included in next piece, lumps noted as. with large crinoid stem-segments. Bed just below with sp. granular filled with quartz.  
535-565- in about 10' of rock fossils common:

*Lyrispecten* with *Lingulodiscina*, *Nyassa arguta*, *A. fasciculatus*, *P. flabellum*, *Homalotus*, *S. granulosa* type, *A. bulbosus*, *A. cora*. At the top of this bed *A. bulbosus* is the commonest fossil.

Strike N61E 14°NW

565-621- In top of this interval fossils are common! Large *S. granulosa*, *L. perplana*, *B. alveata* (small), *Trinophora*

621-951- Coarse heavy bedded blue-gray ss. Exposures end at point where old and new roads join. about 50 yds southeast of the city line.

951-1241- Covered - Elks Park entrance

1241-2976 covered.



10000

5000  
1200

10000  
2500

15000  
3850

20000  
5300

25000  
6400

30000  
7650

750

800

27



1586

(16)

2926-2958 - About 15' of cross-bedded  
 & thin bedded blue gray ss. containing  
 limonite masses containing lenses  
 of large *Spirifer* and one well  
 defined band made up of large  
 numbers of the *Spirifer*. Dip over  
*Spirifer* band  $\delta 7\frac{1}{2}^{\circ}$  (Component)

Portland  
 Point

3058

6118

1529

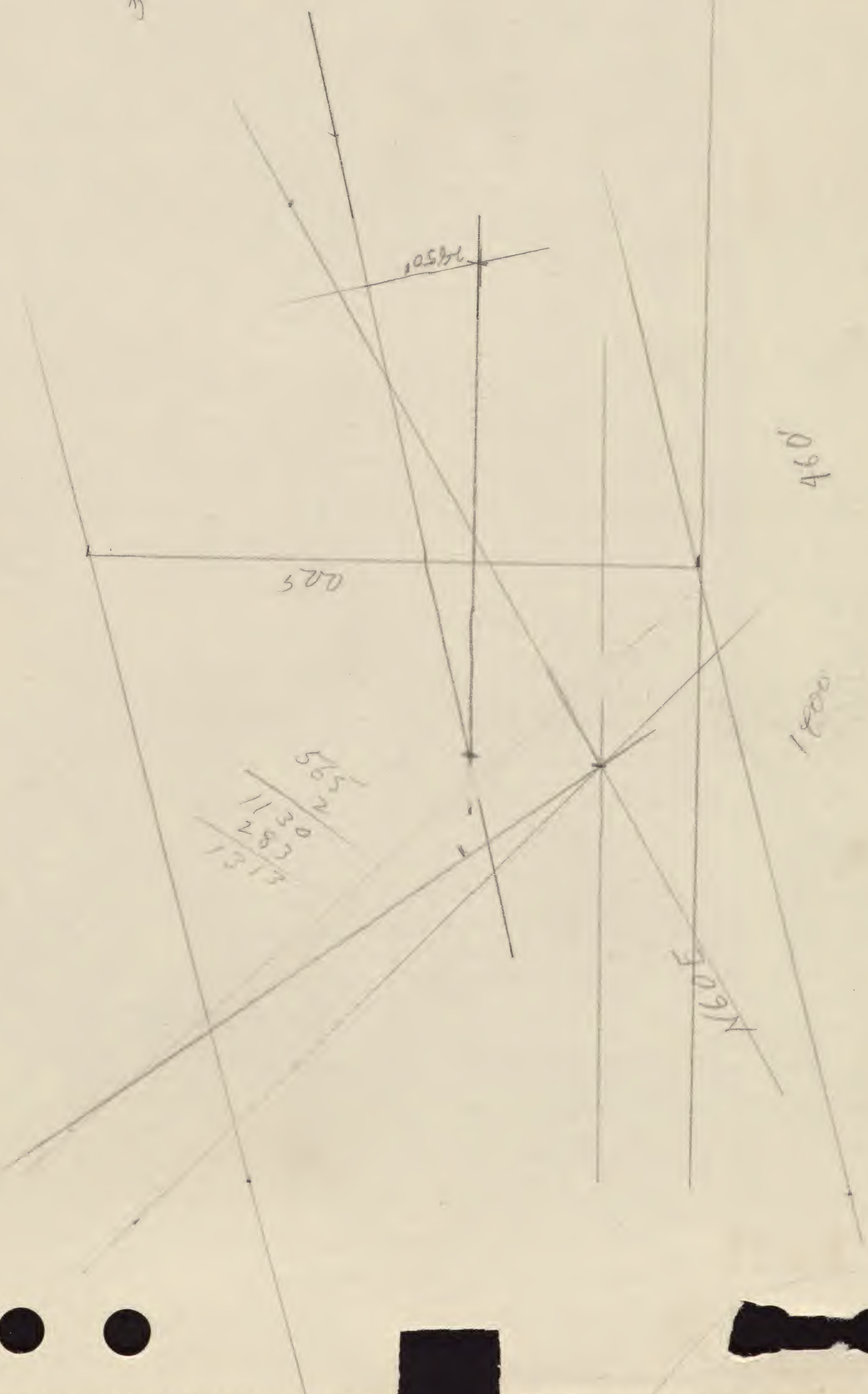
7647

2958-3058 - Covered. At 3058  
 a small ravine cuts up into the  
 woods. Many exposures in woods  
 About 55-60' above road  
 comes Vitulina bed. above cross-  
 bedded ss in a relationship  
 just like that in park. Above  
Vitulina beds are all shalier toward  
 top of hill where *Tropidoleptus* appears

3058-3908 - covered. At bend of road  
 comes about 20' storm-well ss  
 underlain by blue gray sandy sh.  
 N60E  $8^{\circ}$  NW.



3939





July 24 - 0.7 miles from camp <sup>1587</sup> Park  
 entrance, 0.1 mile from city line  
 Entrance N20W, 0.35.  
 N20E, 0.15 17  
 S13E 0.10  
 S42E 0.15  
 due N 0.25 Junction to House  
 S79E 0.15 Vitulina bed  
 S79E 0.10  
 S60W 0.20

Point Peter - much fractured land so  
 with little evidence of bedding  
*P. lirata*<sup>a</sup>, *H. dehayi* f,

Exposure in front of Transient  
 camp contains *P. flabellum*,  
*Aviculopecten*, large *Spiriferoids*,  
*M. concentrica*. Presence of  
*P. flabellum* indicates Ludlowville.  
*Vitulina* occurs ~~slightly~~ not far  
 above this bed and I think  
 is the base of the Moscow

Downhill from Starfish bed.  
 at first sharp bend of road is  
 a layer containing *Chonetes*  
*coriatus* (flat) in abundance.  
*Cypucardidia complanata* was  
 seen in starfish bed, also *S.*  
*crinitaria*. This bed suggests  
*Splanostele* but may be higher







July 25

1588 18

Strike on Onondaga  $N54^{\circ}E\ 13^{\circ}NW$ .

Onondaga 100 yd SW of fork  $N40^{\circ}E$  Strike  
Jy 25' - fossiliferous Esopus with Leptæchia  
and Rhipidomella. Outcrop marked A is  
undoubtedly uppermost Esopus or  
lowermost Onondaga

Jy 25' - Lower Onondaga transitional?  
to Esopus below. Esopus well exposed  
along R.R. and highway

July 25<sup>4</sup>

Roses Point - Section begins 325 paces  
SW of intersection of road and R.R.  
Beginning of section almost on strike  
200 paces SW. of road following  
fossils seen in lumpy fracturing  
sandstone:

*Marguta* & *Leiopteria*

Large *Spina* *Athyris* cora

These run for 50 paces. Rock then  
becomes shalier & breaking into  
smaller pieces. Strike  $N45^{\circ}E$   
 $42^{\circ}NW$  measured on upper bed with  
*Athyris*. The section continues 50 paces  
along road to NW.



to nearly the top of the hill. We found practically no fossils. The rocks were mostly wet and ~~condemni~~ conditions not good for seeing fossils. From Prospect Hill down to Huger not exposures occur along the road. Fossils are rare but all seem to be Hamilton forms. The Sp. tullius at the top of the exposed section may be near the top of the Hamilton.



July 25<sup>5</sup>

1589

19

Dark gray thin-bedded ss. & blue gray  
ss. with *Tropidoleptus*, *S. tullius*, *P. reticulata*  
*Actinoptera*. Suggests post-Hamilton  
N42 E 16° NW.

Jy 25<sup>6</sup>

Varied ss. with *I. caninus*,  
*Nucula*, *Pal. Yemistriata*, et *C. coronatus*.  
0.35 mi.

Jy 25<sup>7</sup>

Irregularly fracturing ss. with  
*Tropidoleptus* & large crinoid stem  
segments

Jy 25<sup>8</sup>

Dark gray mudstones with *P. flabellum*  
snails, *Athyris*, *Gonophora*.

Jy 25<sup>9</sup>

Cut about 100 yds long of purplish  
mudstone with *M. elongatus*

Jy 25<sup>10</sup>

Long section in woods up gully, saw  
what suggested *S. tullius* near top.  
Rocks nearly all ss. but few fossils

over



July 25

Spent most of morning looking at Esopus. Excellent exposures along the east shore of the Neversink opposite Goddfrey and Huguenot. Due east of Port Jervis Esopus is exposed along the Erie R.R. at the big bend and for some distance to the SW. Along the highway just below the railroad Esopus is exposed at J 25'. Here it has Leptocoelia and Rhipidomella. A little SW. of this exposure the Esopus has a veneer of several feet of lower Onondaga.

At Rose Point the lower beds contain Nyassa and thus belong to Skaneateles. This section runs for 350 paces. From the road intersecting at 3 in Monticello R.R. and for about 75-100 yards outcrops can be seen in woods and these go up about 250.



July 26

1590

20

N30E 13° NW. Section extends on Prospect Hill from about 980 to about 1080. At base is a heavy ledge of X-bedded ss. followed by crumbly greenish gray beds, then a heavy ledge of X-bedded ss. These X-bedded ss. are interbedded with the crumbly greenish beds. The latter are of the ~~type~~ continental type. We saw no fossils.

Jy 25<sup>9</sup> =  
Nuculites  
oblongatus in  
biologic

Jy 25<sup>5</sup> revisited - Outcrop about 125 yds. long beginning at about 900'. Found also *P. liata* here. The dark thin flaky shaly ss suggest post-Hamilton.

Jy 26<sup>1</sup>

Dark, almost black, shaly ss thrown out of a trench in deepening stream. Contain *Paracyclops*, *Actinoptera* and plants.

Jy 26<sup>2</sup>

Elevation about 660. About 40 feet of irregularly fracturing sandy mudstone with:

Large *Spinifer*, *P. hamiltoniae*, *P. rana*, *Impidoleptus*, *fatlecoronatus*. About 0.1 mile farther down road is similar rock but without fossils. 0.05 miles



1591

still farther down are platy ss  
with "storm-rollers" about 10'  
Component of dip 18° NW.

21

July 26<sup>3</sup> - Exposure of blue gray shaly  
ss or mudstone with a few  
fossils: *Encrinurus*, *Camerozoechis*,  
*Callinopora*, *Spinifer*. N 42 E 25° NW  
Storm roller beds are sandwiched  
between the shaly beds. Exposure  
begins about 25 paces west of short  
road intersection with main road  
& extends to west for 128 paces.

July 26<sup>4</sup> Section approximately  
N 30 E over hill overhanging  
beds with *Vitulina*.

A. *Vitulina* comes about 70' above  
the highway or at      feet. It  
overlies heavy-bedded conchoidally  
fracturing ss with storm rollers.  
Near top ss becomes finer grained  
and thinner bedded.

B. *Vitulina* occurs in the  
midst of the ss in calcareous  
material that has been

leached. *Rhipidomella* is  
abundant, also a large *Spinifer*.  
The ~~ss~~ bed containing *Vitulina*

is about 3' thick. Above  
*Vitulina* about 1' is a thin  
layer with many *Rhipidomella*.

*Vitulina*  
Coarse  
heavy-bedded  
conchoidally  
fracturing





—



probably the same as bed behind transient camp. Above the <sup>22</sup> the rock is shalier, thin-bedded & irregularly bedded, dark blue gray in color. 230' above Vatutina comes the first storm-roller zone. This is practically the first change in lithology above Vatutina.

Above 230' the rocks become coarser but preserve their Hamilton look. At 360 the top of the hill is composed of a storm-roller zone with the dip of thin-bedded ss. going in same direction. This rock has the appearance of Post Hamilton, Achirodesma seen here, Tropidoleptus, Cyrtina.

Went up hill, at top bearing on Eric R.R. to Mill Pitt N 60° W, on lower on hill at Matamoros S 12° W. On Hightop S 22° E. The intersection of these brings us to 360' above road by barometer.

At 305' on way down Tropidoleptus, Petersonia, At 295' T. carinatus, Chonetes, Spinifer sp.



265 - 0.4 mile from Erie RR  
bridge over river road to  
Lebanon town. Exposure extends  
from first house on SW side  
road upstream for 450 paces.

At 90 paces from house: *Pdl.*  
*Venustulata*, *Chonetes coronatus* (flat)

At 117 paces large *Sp. granulosa*,  
*C. complanata*, *Rhipidomella*, a.  
N 62° E 12° NW.

210 contorted bed.

Between 280 & 350 were seen

*Sp. granulosa*, *Rhipidomella*,  
*Microspira*, *Spirifer*, *Orndulphia*  
*Pdl. constricta*, *Paralldodon hamiltoni*  
*C. coronatus*, *D. arcuata*. *Cyrtina*

At 400 rocks are sandier, lumpy  
& break into small lumps. *D. pulchra*  
At 450 section ends. *J. chinensis*.

I believe this is all Lebanonville  
low in the "Moscow".

shaly dark gray ss.







1594

July 27

24

July 27 - Just below Erie RR bridge over Delaware at Mullift. Rocks at river level and up into R.R. cut are post-Hamilton containing Leiorhynchus, Actinoptera etc. Rock consist of flaggy ss. interbedded in dark shaly ss containing the Leiorhynchus. Exposures along road from Erie R.R. bridge continue for 0.8 mile.

July 27' - Started at road at 520. At road about 20' of ss N W NW. Covered 115' to 635' on slope. Section approximately N40-50° W. 635-700 ~~covered~~ Blue-gray shaly blackly ss. 700-755 - covered 755-775 - Blue gray ss with contorted bed at top. Same bed as that at top of hill over Vitulina. This contorted bed consists hard concretions of ss. with thin bedded shaly ss wrapped about them. N62E 16° NW

Portage East of Sparrow Bush is 0.35 mi from intersection with short road to farm house

Only Missions exposed



1595

July 27<sup>th</sup> - ledge of contorted ss. like  
that on top of hills near Spout  
Bush. No fossils seen. Shale as  
under contorted bed breaks like shale 25

July 27<sup>th</sup> - About 40' or so shale ss.  
with contorted bed at top. Contains  
*T. caninus* & *Spirifer* like *bullus*

Estimate Snowdaga to contorted zone, dip of 10° on  
*Vatulina* bed to be 2650'



1596

Miss Goldring wants good  
Hypothyris.

76

July 28 - At West Bortville the  
New Scotland is exposed at the  
base of the hill on east side  
of Valley. From the New Scotland  
to the <sup>475</sup>Thompson ga must be about  
1180'

Section along road (Mf. 17) west  
of Wurtsboro. First rock exposed  
just east of fork  $\frac{1}{2}$  mile west  
of Wurtsboro. Exposure extend 134  
paces to east of fork. At base  
about 1' of dark shale succeeded  
by ss. mostly moderately heavy-  
bedded (1") to thin bedded with  
storm-roller layer near top. At  
25 paces a doubtful Tellinopsis was  
seen. N  $37^{\circ}$ - $45^{\circ}$  W  $56^{\circ}$  NW.

0.2 mile W of stream & highway  
crossing coarse red beds & green  
coarse ss. N  $57^{\circ}$  E  $23^{\circ}$  NW. There  
are clearly post-Hamilton, as may  
be all the exposures west of  
Wurtsboro.

July 28 - Outcrop N  $35^{\circ}$  E  $46^{\circ}$  NW -  $60^{\circ}$  NW  
July 28 - Escopus - Glenview Contact at  
about 660'. To SW of contact down  
hill excellent Glenview exposures.



1597

The road (My. 211) on which these 27  
exposures occur is a new one  
and not quite completed. The  
road cuts over the west face  
of the hill just below the summit  
and to the west of the lake. The  
face of the hill is undoubtedly  
limestone. In the base of the  
exposures we found *Leptæna*

July 28<sup>3</sup> - Exposures beside road  
just N.W. of Spring Glen  
About 1/2 mile N 37 E 52° N  
Upper bed consisting of ss (platy)  
+ dark shaly ss. contains

*Leptæna*  
*A. erectum* c  
Large *Spinifer*  
*Lophospira pseudodonta*  
*Crinaria aculeata*  
*Brachygonia circularis*  
*S. nodosata*  
*C. complanata*  
*L. cinctatus*  
*P. flatellum*  
*H. arguta*

These beds suggest upper Colgate  
Exposed at sharp bend in road

Rock exposed down dip  
for 60 paces.







Jy 28<sup>4</sup> Cut in thin bedded ss. on  
R.R.

Jy 28<sup>5</sup> - moderately heavy bedded ss  
with plants N 35° E 53° NW

28

July 29

Probably very top of Hamilton

Jy 29 - 0.9 mile along <sup>Samberg</sup> River road  
from intersection at Spring Glen  
Green crumbly shales and olive  
shales interbedded with coarse  
blue green sandstones containing  
plant fragments and clay balls.  
Section exposed for 125 paces.

Strike N 20° E 42° NW. In green  
sandy shales at base of section  
(5' above) a few fossils were taken.  
These suggest basal Gilboa.

1.55 ~~to~~ miles from intersection at  
Spring Glen come first reds seen

Jy 29' - Exposed on opposite side of  
stream from section of road  
extending from outcrop at Jy 28<sup>3</sup>  
~~up slope~~ to first house at bend  
of road are exposures of ss, X bedded  
and interbedded with the olive crumbly  
shales. I would guess the base  
of these exposures to be no  
more than 100 yds from outcrop.



with starfishes.  
Beds go up slope 40'

1599

29

July 29<sup>th</sup> Section along US 209 NE  
of Tenen Kill. Section begins at  
about 0.1 mile N of crossing of  
Tenen Kill with highway. For  
54 paces dark blocky shales with-  
out fossils is exposed. N 25° E 42° NW  
84 paces to junction of Tenen Kill  
road + 209

North from junction of Tenen Kill  
road + 209 97 paces covered

97-230- rather blocky shaly  
nearly black ss.

209-287-covered

287- ~~ss~~ about 5' above base  
of section comes 1' zone containing  
*Camerozoechia* in abundance, large  
*Spurifer* + clams. Then rocks 3  
miles. This bed is concretionary  
in structure. 3' above *Camerozoechia* is  
a shaly layer abundant in *Productella*.  
At 337 is a thin roller bed. At 402  
*C. complanata* + big *Spurifer*. Rocks from  
387-473 are heavily bedded blue-gray  
fine grained ss.

473-498 dark gray ss, nearly black

At 530- Large *Spurifer*

At 593- section ends for interval

593-712 covered

712-748- heavy bedded shaly ss.

with *Aviculopecten*, *P. flabellum*, *N. furcata*,  
*Strophomena*, *K. emarginata*



1600

748-792 Same

792-843 Rock changes to fine  
crumbly shaly ss. N34E 49° 30

843-895 - Section becomes  
heavy bedded ss. with layers up to 1'  
at 869 the layers are very massive.  
Section ends at 895.

0-593 - N5°E

593-895 - N15°E.

July 30 -

N30E 41°NW  
Vicinity of Phillipsport - Cut on N.Y. O.  
W. between Summitville and  
Phillipsport. About 20' heavy-bedded  
ss. with concretionary structure  
interbedded with nearly black  
shaly sandstone. One fossil  
only was seen. A Spirifer cf.  
Sp. andaculus. The beds are  
probably Hamilton. This cut is 1393  
paces from Road & RR crossing  
Cut 218 paces long.

218-508 covered

At 508 comes 15' lumpy, irregularly  
fracturing ss. M. pygmaea.  
N. arguta, P. lirata. These fossils  
come from uppermost ledge  
which actually may not be in  
place. These beds are exposed for  
35 paces.



1193  
2  
2386  
597  
2983



543-1043 Covered.

1043-1143 lumpy ss at base but  
blue gray thin bedded ss like 31/  
Ludlowville in upper 3/4.

Petrocrania, Camerotoedidia, Aviculga  
Cut about 10' high. These cuts are  
evidently all Hamilton.

1143-1393.

Section continues from R.R. bridge  
up stream. From R.R. bridge to  
stream & highway crossing, rocks  
at base are chiefly with Stromingia  
about 20 feet (dip about 10°) upstream  
appear large Spirifer granulatus?  
S. alveata?, C. coronatus. N 30 E 40° NW  
This section extends to road. Upstream  
for 90 paces the section is covered  
Then comes about 5' of coarse ss.  
730 paces upstream comes thin-bedded  
X-bedded ss. At 260 paces end.  
260-299-covered

299-327 - ss & olive shale

327-402 - Comes a water falls.

About 15' high. Between these  
intervals the rocks are mostly  
blue gray porous ss. with many  
plants, layers of concretions &  
feruginous pebbles. The rocks  
suggest the post-Hamilton. They  
may be Hamilton but not of  
Hamilton facies.

402-438 - covered

438-638 - These ss. continue



$$\begin{array}{r} 910 \\ 570 \\ \hline 340 \end{array}$$

$$\begin{array}{r} 1200 \\ .26 \\ \hline \end{array}$$

$$\begin{array}{r} 572 \\ 273 \\ \hline 845 \end{array}$$

$$\begin{array}{r} 590 \\ 305 \\ \hline \end{array}$$



upstream with only slight gaps between them.

1602

32

Jy 30<sup>th</sup> - Small outcrop beside road  
0.75 miles SW of Wurtsboro.  
Lumpy shaly ss with M. arguta  
Huntston? rocks exposed just  
below Haven

Jy 30<sup>th</sup> - Exposures appear at base  
of woods 100 paces west of 209.  
Long section. Dip + strike at  
top of section N 41° E 41° NW.

340 = Summit 910

Total section

875 420  
370 570  
275 250

S. tullius 875 Actinodonta

I. carinatus 845

340

Base of fine bluish ss. 820

Total section 340'

To I. carinatus 275'

To S. tullius 305'

Dip and strike at bottom same as  
top. Total section is 1200'

To base of fine ss (Moscow) 250'

Moscow would equal about 300'  
from beginning of fine ss to  
top of section

26  
340 907  
68  
220

340  
1250



1693

July 31- Climbed up ~~gully~~ <sup>33</sup> branch of gully which flows between T.R.R. of Erie R.R. on Port Jervis sheet. Nothing in gully or on top of hill where gully heads. Area embraced by 1000' contour all covered. The uppermost storm-roller bed is at 920 or just 400' above the road, and is exposed on the south E. slope of hill facing Elko Park. The Vitulina bed lies about south 30°-40° W of this exposure.

About 10' below uppermost storm-roller were seen Tropidoleptus sp. mucronatus & a sp. like Tullius. 355 above rd. Storm roller with Tropidoleptus.

Jy 31<sup>1</sup>- Collected at Vitulina bed and found large Centronella in it, definitely clinching the Portland Point age of the bed. Portland Point should include the Rhypidomella bed & then would be 3' thick.

Jy 31<sup>2</sup>- Ledges about 30' above level of reservoir no. 2, platy ss and shaly dark blue gray ss. Tropidoleptus & Spirifer cf. tullius



Jy 31<sup>3</sup> At Northeast end of road  
along reservoir, 8-10' shaly ss. &  
thin-bedded ss with upper 34  
storm-roller zone or contorted  
bedding.

*Sp. pennatus*, *I. caninus*, *Apicandella*  
all rocks along reservoir are  
fossiliferous & contain Hamilton  
forms.

Jy 31<sup>4</sup>

Section N 30° W thru woods.

D-80 - covered

At 80 - 15-20' ledge x-bedded ss. with  
*Tropidoleptus* & *Sp. cf. Tullius*. 80-93

93-164 covered

at 164 (40 feet above) lake ledge of  
platy & contorted ss.

164-217 - to top of first hill

217-411 - to slope of hill across  
swamp (55' above lake) ledge of  
dark amaceous shale. Obelieve  
this last ledge is near beginning  
of Port Hamilton

880' on  
Park map

*Vitulina* bed in park is at 870'  
by barometer. About 3' thick, not 6



August 1

1605

35

1.3 miles NW of intersection of 190 and 209 on 190 exposure on Pa highway 190, 60 paces along by lumpy, cleaved sandy mudstone containing Atrypa, Vitulina, Nyassa, Stenoid.

0.1 mile farther along (1.4) was seen a float block of coral bed probably not far out of place. A Pentagonia was taken from this piece.

Centerfield locality is 0.85 mile toward Stroudsburg from intersection of 190 + 90.

Along 90 toward creek + RR for 400 paces Ludlowville is exposed. At 400 S. demissa was common. Portland Point should be not far above this.

<sup>612</sup>  
Along ~~209~~ Onondaga + Eggus exposed out off East Stroudsburg. On 209 Onondaga exposed northeast of Marshall's Creek. About  $\frac{1}{2}$  mile NE of Echo Lake closely cleaved lower Marcellus is exposed. Here the cleavage surfaces weather



Light colored and bedding shows as horizontal lines. clt gives the exposure the appearance of limestone. This exposure suggests the lower Marcellus about  $1\frac{1}{2}$  north of Port Jarvis.

0.6 mi. farther on is top of Onondaga dipping  $N 52^{\circ} E 15^{\circ} N$  (compass set with  $9^{\circ}$  declination) From here NE the road cuts more & more into the Marcellus which is well exposed in many places. On N side road at locality 1.1 mi. NE of Echo Lake Marcellus is exposed making Onondaga exposure the top.

### Section on Raymond Kill

0.1 mi. East of Union school, 50 paces exposure with *Leiorhynchus*, *Actinoptera*, *Leiopteria*, *Bembexia*. Rock is mudstone with much sand. Appears to be definitely Post-Hamilton. Exposures at 0.25 and 3 but no fossils seen.

At 0.6 last exposures of dark post Hamilton mudstone appear. Where road crosses Raymond Kill exposures 50 paces west of Kill and up hill to east carry Hamilton fossils: *S. concava*, *Dovirillina*, *Gennaeocrinus*, *Elytha*,



2548  
300  
75'



*Cypinacodella bellistriata*, *Thammysia*  
*arenata*, *Sp. granulosa*, *Sp. pennatus*.  
 This interval suggests the  
*Spirifer-Atypa* zone of the upper  
 Moscow.

At 1.35 exposures become  
 nearly continuous: At & near top  
 were seen *Spirifer*, *Nyassa*,  
*Tropidoleptus*, *M. concentrica*, *Athyris*  
 (large), *Nucleospira*.

### Pictures

- Our Ranches-park
- 2 Vitulina bed.
- 2 Tully at Stroudsburg.
- Veriklume
- 1 Tully at Stroudsburg
- 3 Coral bed "
- 1 Marcellus "

Starfish bed in park 185' above  
 intersection with (42, 97).



Aug 2

Section along 42-97 just outside of Port Jervis. From cannon near base of cliff to NE about 200 paces mudstone is exposed which extends upward becoming harder and forming a hard ledge 100-120' above the street. This hard ledge is exposed again 300 paces N of the cannon at the intersection of the river road and the new segment of 42, 97. which goes up hill N 85° W. Strike & dip on this lower ledge is N 42 E 12° NE. 16 paces farther along is a low ledge of same hard lumpy ss with concretions layer at top. Then comes crumbly shaly ss.

16-101 finer shaly ss gradually becoming sandier to form here a moderately hard ledge. I would guess this interval to be about 100' stratig.

101-251 - In last 50 paces rock becomes very massive & hard and forms a boss on S side of road exposing the much fractured upper beds. Here we saw S. bisulcata and N. angusta. I think this is still in the Marcellus but probably near the top.

100'

140'



10'

251-271 - softer shaly rock  
for about 10' strat. with 6"  
layer of concretions on top. At  
this layer rock above becomes  
10' flatter and breaks into flat  
pieces rather than small lumps

10'

271-323 - Thin-bedded flat-breaking  
shaly ss. ends. No fossils seen  
in it. Road bears N 55 W here

15'

323-349 - massive heavy ledge  
very sandy

349-454 - dark shaly ss  
becoming bluer lighter &  
more massive upward. At  
top contains (25-50) contains large  
Spinifer + Rhipidomella. This  
is just opposite observation plat-  
form. Under platform were seen  
Rhipidomella, Leptostrophia, Spinifer

100'

This bed is capped by about 1'  
of limy ss. with Camarotoechia,  
large Athyris, Sp. pueronatus,  
Leptostrophia, P. stellum.

35'

the road goes N 30 W. Road 70' above

454-523 Rock becomes now  
a series of ledges or layers going  
from fine to coarse, layers 10-20'  
thick. At 493 rocks have large sp.  
This interval is a lumpy ss.

523-623 Rocks tend to break  
into smaller lumps. At 538 came  
circular stems, Myasa.

Road goes  
N 30 W to City line



97.35



90'

at 595 and about 5' up 40  
comes *Cynocrinus*, *Aviculopactin*<sup>minor</sup>  
large *Spizella*, *Sp. minor*, *Crinoid*,  
cup coral, *Camara bechia*, *P. flabellum*  
At top of interval ss. becomes  
coarse & x-bedded & like Colgate  
ss.

20'

623-646 - covered.


10'

646-658 - hard lumpy blue gray  
ss. with large *Spizella*, crinoid  
stems, *Leptostrophia*, *Petrocrania*

10'

658-675 - covered

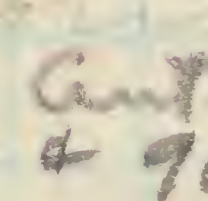
20'

675-717 - lumpy ss with *Aviculopactin*  
717-989 At 772 comes *Paraceras*  
and *Melocrinus* . At end of

50'

section about at 975 comes *Pterinea*  
and *Tropidoleptus*. The rocks here  
have been massive ss or heavy-  
bedded platy ss. City line about 75  
paces from end of section.

Collecting park roads -  
Park entrance exactly 0.1 mile  
from city line.

0-0.15 - first minor band large  
exposure. 30' exposure showing  
4 layers of *strophomena* rollers. *Camara bechia*  
*Tropidoleptus*  *Antirionella* bed 0.15 mi from entrance  
& 90' above entrance

0.3 to first major band where  
*C. coronatus* occurs.

0.4 to starfish bed - 205' above entrance  
0.55 to 2nd major bed.

ancient set  
at 0 at  
intersection  
of river road  
& 42, 97.



From C. cornutus bed at first major bend we go down in the section to second major bend.

345' on map.

0.8 entrance to transient camp elevation 335 from intersection of River road & 42.

Between 0.34 & 0.55 we saw Camanotoechia, Tropicoleptus, Glypto. erectum, large Spirifer. Beds between 0.55 & 0.8.

125 paces below entrance to transient camp comes Vitulina at 325' which thus underlies the beds at the camp entrance.

Upper Vitulina bed comes at 385' or 870' ~~at~~ elevation.

At first main bend and about 100 paces up the road is a layer suggesting the Centronella bed.

Aug. 2. Marcellus on road about 1 mile N of Port Jervis. Rock is a fine grained ss. strongly cleaved, with strike of cleavage  $N 50^{\circ} E$  and dips  $60^{\circ} 5' E$ . The exposure is 0.9 mile long. At second farmhouse rock is exposed toward the river 100 yards.



August 3

42

Rose Point Glen - Elevation at start 580'  
 First rock seen at 618'; thin-bedded ss - splitting into plates  $\frac{1}{2}$ " to 1" thick.

630 - *Tropidoleptus* abundant

670 - sp. *micronatus*, *C. coronatus*.

*Tropidoleptus*, *Neurulites*, *Parallelopora*, sp. of *Tullius*.

750 - 775 covered

820 - 835 - ledge of storm-roller coarse ss. enclosed by thin-bedded irregularly bedded ss. Fossils

fairly common: large *Leptæna*, sp. like eastern *mesastrialis*, possibly like sp. *Tullius*, *Belonophontes*.

*Diplema*

These upper layers are probably post-Hamilton. At 840 gully flattens and streamers turn off to east or southeast. Crest of hill at 835 is formed by fossil ledge, and hill appears quite flat to west. Concluding must be wrong. Could not measure structure here but dip is much flatter than at the point. At 805 *Tropidoleptus*

A3' - X-bedded heavy-bedded ss containing *S. Tullius* & *Tropidoleptus*



A3<sup>v</sup> - Slope or bluff on west side river opposite Sparrow Brook.

43

45' above river level: *T. caninatus*, *B. annata*, star-shaped crinoid stems, *Sp. Tullius*

55' - Pebble bed with *Tropidoleptus*

63' - *Urtulina*, *C. coronatus*, *T. caninatus*, *Sp. Tullius*, *A. erectum*

65' - *T. caninatus* a

70' - *T. caninatus*, *C. gregarius* Beaman  
This is probably beginning of post-Hamilton. The Hamilton thus ends at 510' in the cliff.

A3<sup>4</sup> - Thin-bedded ss with stone roller zone of very thin ss at top.

Cut from Erie R.R. Bridge at Millcreek to end is 0.7 mi. Strikes & dips N 70° E 12° NW; N 80° E 10° NW; N 55° E 8° NW; N 65° E 9° NW.

Long section between Haven & W. Brookfield is 2.5 mi, NE of W. Brookfield and 0.9 mi. SW of Haven.



1614

Aug. 4

44

A4 - ledges in Vernoy Creek, hard ss. & shaly ss. Nyassa at base N30E 45°NW. Catskill type exposed upstream

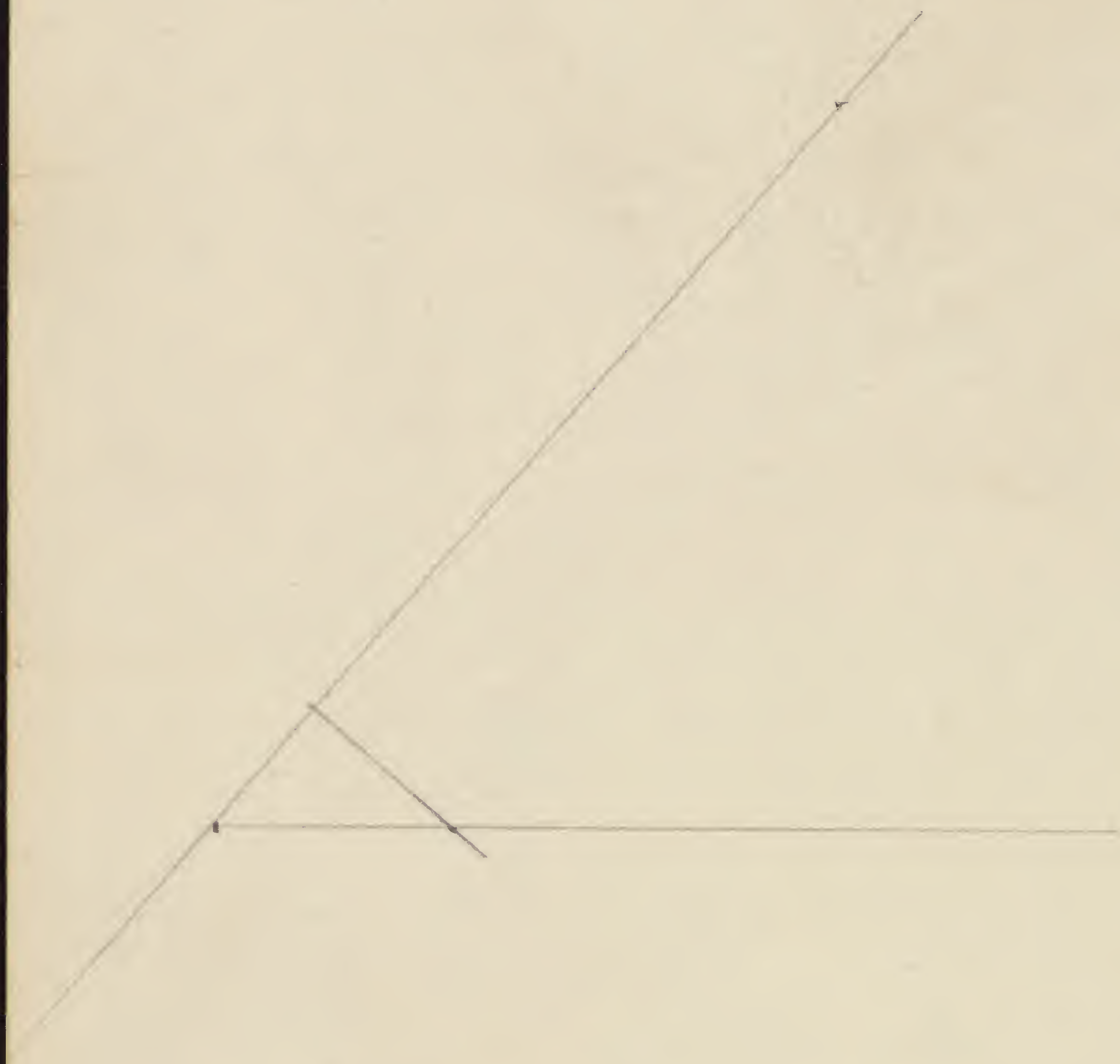
A4' - at power plant above bridge over creek about 105' feet a thin layer or lens containing *Rhipidothyris plicata* in abundance. N35E 35°NW. Magnificent section of rock mostly of Catskill type.

Many exposures of Onondaga along Hy. 209 between Hurley and Stone Ridge.

A5 - Marcellus exposure in hill

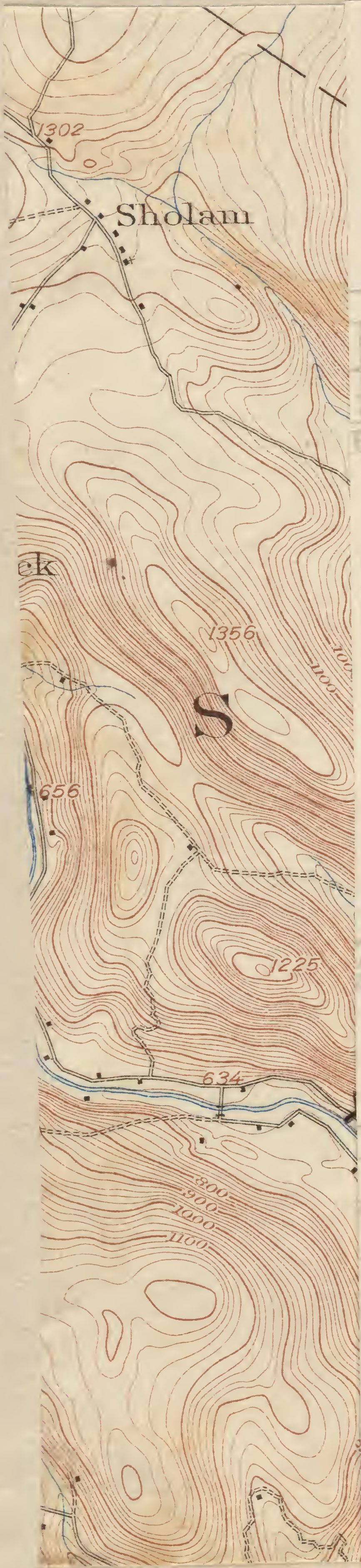
A5' - Onondaga (upper)







1614a



Roads and buildings	Ruins	Cliff dwelling	Good motor road	Poor motor private road
Dam	Dam with lock	Canal lock (point upstream)	U.S. township section and recovered	
Bench mark (supplementary bench mark shown by cross and black figures without lettering)	Cemeteries	Church, School (distinguished on record maps)	Coke	
<p><b>RELIEF</b> (printed in brown)</p>				
Contours above level (contour maps)	Contours (Contours showing depth of water printed in blue)	Depression contours	Level	
Cliffs (shown by contours)	Mine dumps	Tailings or mining debris		



1614a





August 5

45

A5<sup>2</sup> Rondout Creek at Napanoch  
and NW to Hook Lake.

First exposures appear about 180  
paces upstream from bridge at  
about 290' elevation in stream. Here  
rock strikes  $N35^{\circ}E$   $53^{\circ}NW$ . Rock is  
blue gray shaly ss. + ss. mottled  
on the surfaces, mud-cracked,  
ripple-marked and with scattered  
storm-roller beds + pebble beds.

At 280 paces upstream came  
Paracyclas. In a pebble bed 330  
paces from bridge came *C. coronatus*  
Sp. granulosus type, *P. lirata*.  
Between 387 and 398 in a pebble  
bed were seen: *C. gregaria*, large  
*Spinifer*, *N. oblongatus*, *Grammysia*,  
*P. flabellum*, *Paracyclas*. All these  
occur with small pebbles, *Ly. rockii*.  
At 387 a storm-roller zone occurs  
398-503 - ~~covered~~ hard ss +  
storm-roller beds with beds  
containing small quartz pebbles  
up to size of 5-cent pieces and  
larger pebbles of quartzite or ss.  
At 503 comes a bed of about 10'  
thick of greenish shaly ss.  
503-573 - heavy bedded ss +  
shaly ss. to base of falls. *Canavertch*  
common. Falls about 20' high.  
Represents about 10 paces.  
503-583 - Falls  $N34^{\circ}E$   $52^{\circ}NW$ .



Bed of large *Spirifers* just under falls.

46

583-629 - Steeply dipping ss. with hackly fractures. At top *Cynocardella* *kennerlyi*, *P. flabellum*, *Gammysia* large *Spirifer*

At 648 - *M. arguta*

At 667 - Along Mill-race and about 50' from gate sandy ledge and shaly ss. 10' above it thinning with fossils:

*M. arguta*, *H. dehayi*, *P. flabellum*, small *Camartocchia*, large *Spirifer*, *A. erectum*, *L. macrodonatus* *Son.*, *Thamiltonensis*. Many species could be collected here. This extends to 677.

677-817 - covered

817-857 - Coarse platy ss of Catskill type to base of 2nd falls. Above 2nd falls stream is choked with ledges.

857-942 - Catskill type of ss many plants. At top 10' bed hackly green shale passing into black shale.

942-1052 same rock. This brings one to factory on side of stream. From factory to bridge over creek same rock is exposed. This is true also for 105 feet above the bridge on the west side of the creek.



Just below the bridge <sup>47</sup>  
 The course of the stream changes  
 from flowing down dip to nearly  
 parallel with strike. Stream  
 flows down dip nearly from  
 bridge to first falls. The  
 fossiliferous bed not far  
 above the first falls seems  
 about the same as the one  
 on Seneca Kill & Sandburg Creek.  
 There are probably 3000' of Hamilton  
 rocks from Onondaga to Rhinids-  
 thyrus bed.

A5<sup>3</sup> - Coarse ss. abounding in  
 plants

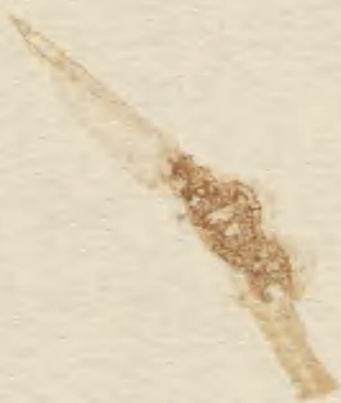
cln bed of Rondout Ck. Min.  
 S. recognized fragment of *Silboa*  
*tree*. I picked up *Archaeopteria*  
 that was not far out of places

A5<sup>4</sup> - On East side road hard  
 dark shaly ss. with layers of  
 limonite concretions. On north  
 side road about 30' vertical  
 crumbly nearly black shaly  
 ss. N34° E, 55° NW

A5<sup>5</sup> small exposure by roadside  
 Cardiff type shaly ss. *Spinifer*  
*mucronatus*, *Leiorhynchus*?

A5<sup>6</sup> - Hard closely cleaved *Marcellus*  
 with *C. coronatus*?







A5<sup>7</sup> — Hard closely cleaved Marcellus  
low in formation

Log from Kerhonkson to Hurley.

N 78° E 15° NW	34.35	Kerhonkson 4 Corners on U.S. 209
	34.6	Onondaga North side rd. = A5 <sup>1</sup>
	36.65	"
	37.35	"
	37.68	"
	39.5	Marcellus
	40.2	"
	40.4	"
	40.7	"
	41.3	Road right
	41.55	Onondaga
	42.2	
	42.7	Marcellus
	43.7	"
	43.8	Road left
	43.9	Marcellus
	44.4	High Falls Road. } side trip to Onondaga
	46.25	" " " }
	47.1	Center of Stone Ridge
	47.8	Onondaga
	48.1	"
N 73° E 7° NW	48.25	" quarry, N side Road
	48.85	"
	49.0	"
	49.25	Road right
	49.75	Marbleton Creek
	50.3	Onondaga
	50.5	"
	50.6	"



50.9 Onondaga

~~50~~51.0 "

51.3-51.4 "

51.7 " (Creek)

52.3 "

52.7 Road right

August 6 A6

SE slope of Mt. Marion, small pit in heavy bedded ss. that breaks into broadish slabs from less than inch to several inches in thickness. Fossils numerous. This ss. is just under the edge of Mt Marion & forms a conspicuous ledge near the top.

Pteronaster

Paraspirifer

Camarotoechia large

Bembesia C

Leiopteria large

G. circularis

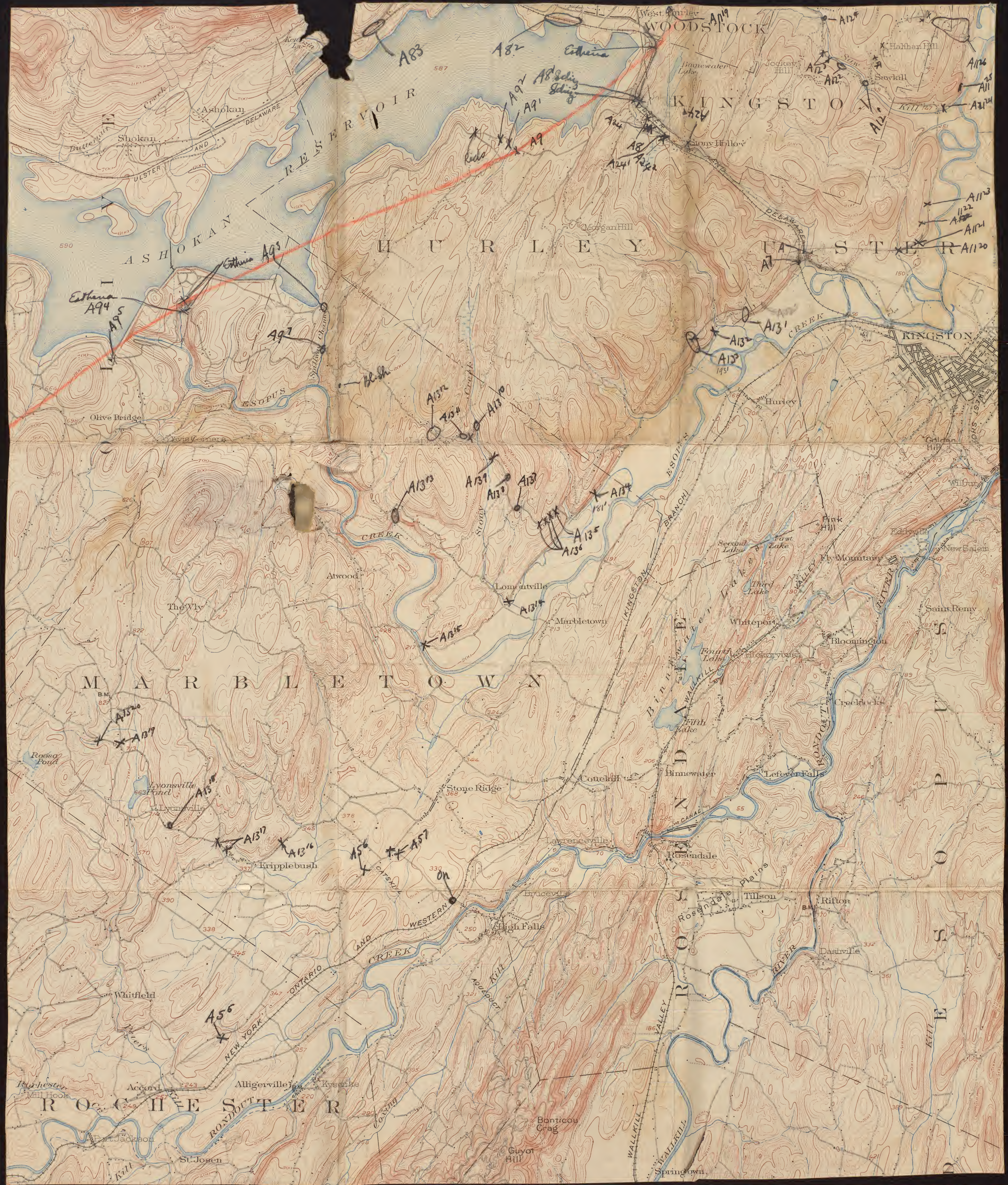
This bed is 320 feet above the road.

In afternoon we drove from Kerhonkson to Patankent, Fautinekill, Mombaccus & Tabasco. Rocks all heavily covered by drift. No bed-rock seen until Sampsonville was reached. Gentle topography east of Napanock due to debris dropped by glacier.



4.2  
30.7  
3.3







The United States Geological Survey is making a standard topographic atlas of the United States. This work has been in progress since 1882, and its results consist of published maps of more than 40 per cent of the country, exclusive of outlying possessions.

This topographic atlas is published in the form of maps on sheets measuring about 16½ by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the standard maps are of nearly uniform size, they represent areas of different sizes. On the lower margin of each map are printed graphic scales showing distances in feet, meters, and miles. In addition, the scale of the map is shown by a fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale  $\frac{1}{62,500}$  means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 similar units on the earth's surface.

Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys for the United States proper and the resulting maps have for many years been divided into three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—relating, for example, to mineral development, irrigation, or reclamation of swamp areas—are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{62,500}$  (1 inch=one-half mile), with a contour interval of 5, 10, or 25 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{125,000}$  (1 inch=nearly 1 mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{250,000}$  (1 inch=nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since 1898, and nearly 37 per cent of its area has now been mapped. About 10 per cent of the Territory has been covered by reconnaissance maps on a scale of  $\frac{1}{625,000}$ , or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of  $\frac{1}{250,000}$ , but about 4,000 square miles has been mapped on a scale of  $\frac{1}{62,500}$ .

About half of the Hawaiian Islands has been surveyed, and the resulting maps are published on a scale of  $\frac{1}{62,500}$ .

The features shown on these maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) cultural works of man, such as towns, cities, roads, railroads, and

boundaries. The conventional signs used to represent these features are shown and explained below. Variations appear in some earlier maps, and additional features are represented in some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, the lakes, and the sea by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff.

Their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined table-land that is intersected by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the region mapped: in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 250 feet. Certain contour lines, every fourth or fifth one, are made heavier than the others and are accompanied by figures showing altitudes. The heights of many points—such as road corners, summits of peaks, surfaces of lakes, and bench marks—are also given on the map in figures, which show altitudes to the nearest foot only. Exact altitudes—those of bench marks—as well as the geodetic coordinates of triangulation stations, are published in bulletins issued by the Geological Survey.

Lettering and the works of man are shown in black. Boundaries, such as those of a State, county, city, land grant, township, or reservation, are shown by continuous or broken lines of different kinds and weights. Metaled roads are shown by double lines, one of which is accentuated. Other public roads are shown by fine double lines, private and poor roads by dashed double lines, trails by dashed single lines.

Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margin of each map are printed the names of adjoining quadrangles. Over 3,000 quadrangles of the United States have been surveyed, and maps of many of them on the other side of this sheet have been published.

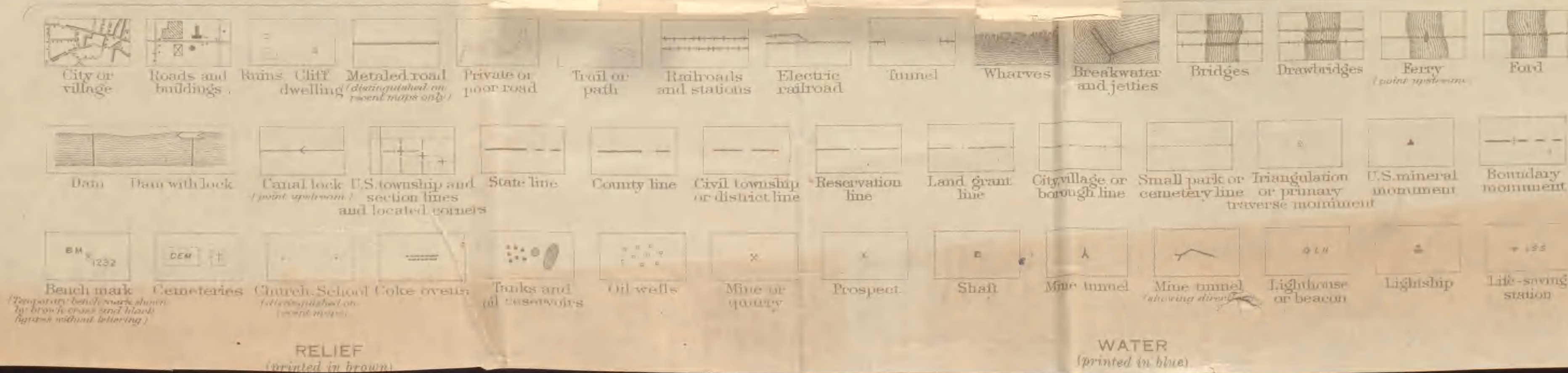
The topographic map is the base on which the geologic map is drawn. The geologic features of a quadrangle are represented, and the topographic features are bound together with a descriptive text to form a folio of the Geologic Atlas of the United States. More than 200 folios have been published.

Index maps of each State and of Alaska and Hawaii show the areas covered by topographic maps and geologic folios. The folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained for 10 cents each; some special maps are sold at different prices. A discount of 40 per cent is allowed on an order for folios amounting to \$5 or more at the retail price. The geologic folios are sold for 25 cents or more each, the price depending on the size of the folio. A circular describing the folios is sent on request.

Applications for maps or folios should be accompanied by cash, draft, or money order (not postage stamps) and should be addressed to

THE DIRECTOR,  
United States Geological Survey  
Washington,

January, 1924.





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1619a

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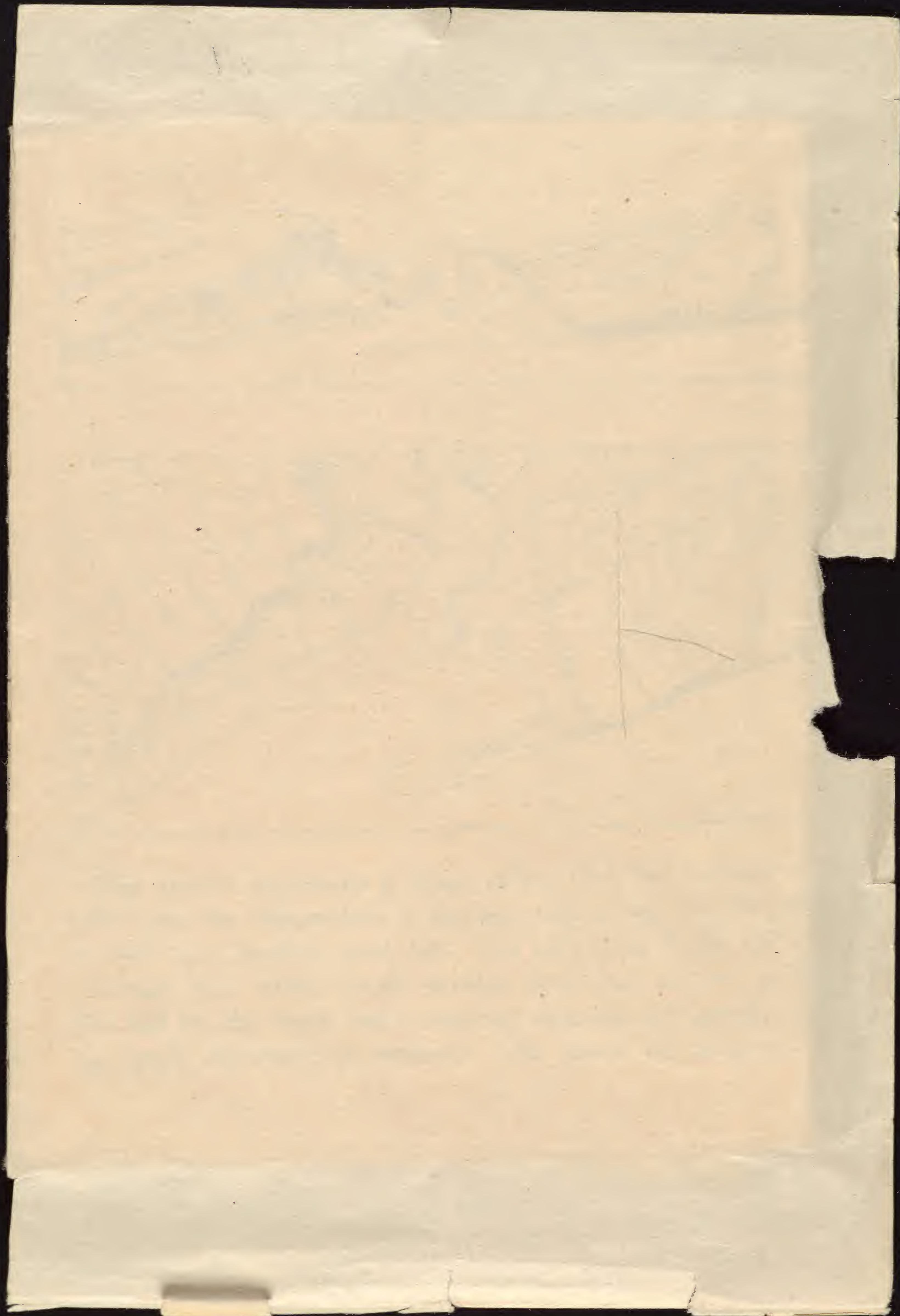
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August 7

50

Section along N.Y. 28 from Esopus  
River at Kingston to West Hurley

30.90 Esopus at Kingston

31.95 Covered in valley.

31.95 Cut 160 paces long exposing 25-  
30' of chunky dark, mainly  
black shale that streaks

1. brownish white near bottom  
but white at top. Ostracods,  
and Euomphaloid snails occur.  
This is the upper part of Chadwick  
Bakoven.

32.2 55' of hard dark gray, limy  
siltstone weathering <sup>light</sup> gray on short  
exposure but to a pinky brown  
when leached. No fossils seen.  
Probably transitional to above.

2. Cut is 3 paces long. Rock on  
weathering breaks into small  
pieces, somewhat blocky. Bedding  
shows as lines of different color  
and lines of solution on  
joints.  $N50^{\circ}W 3^{\circ}NE$

Accession 1 started from  
Alice Dunbar, Hurley, New York

32.35 150 paces much harder &  
fresher limy siltstone, about  
3. 35' high containing small corals  
& Crinoids near top. This is  
probably base of Mt. Marion.  
 $N60^{\circ}W 8^{\circ}NE$

See p. 1677



A7 - on RR behind house + .0x5 mile  
 from RR bridge upper part of hard  
 basal Mt. Marion. By side of R.R.  
 0.15 mi. from bridge About 35'  
 hard calcareous sandy rocks  
 with fossils. In lower part  
 at top of *Spinosa* type, *Anoph-*  
*theca*?, *Orthis cyclas*. In upper  
 part *O. cyclas*. About 15' up  
 a large *Panemka*. The rock is  
 hard + fairly closely cleaved.  
 This undoubtedly belongs to the  
 hard lower Mt. Marion. About  
 0.2 mile from bridge is good  
 cut showing alternating hard  
 + softer beds 2 to 5' thick. A  
 band 3 ft below top contains  
 many pits suggesting places  
 where cup corals weathered out.  
 Dip about 5° NE. Cut ends at old  
 road over R.R. at A.  
 Back to road

32.60 Cut 160 paces long ends at  
 old road at A. Is same rock  
 as in R.R. Hard blue gray,  
 4. cleaved + irregularly fracturing.  
*Leiorhynchus* occurs here.  
 N 70° W 4° NE.

32.85 Crumbly nearly black sandy sh.  
 streaking white, of Cardiff type  
 5 Cut 15' high about 0.1 mile long.



387 920  
 194 230  
 774 150  
 968

N54W 460p. 0.2  
 N74W 387p — 90' 0.2  
 N46°W 258p — 0.1  
 N25W 0.45mi.  
 N50E 0.65mi.  
 N25°W 0.2mi  
 N60W 0.1mi.

1.9.

129  
 458  
 575

N54W 0.25  
 N74W 0.2

774  
 194  
 968

35.20  
 34.75  
 .45

920  
 458  
 735



33.70

From 32.95 it is covered except for shale chips in banks whose distance probably underlain by shale. 20' of dark blue gray crumbly sandy shale of Cardiff type containing *Sp. numeratus*, small shonites, orthocerids + *Bucania*. Probably long covered interval is underlain by this shale. *Murchiesia triqueter*.

6

34.2

Road into Stony Hollow (28A). New road goes N54W from turn to Stony Hollow for 460 paces, then N74W for 387 paces to 95' vert.

34.3

Hard massive blue gray shaly ss. 100 paces long. *Paracyclus*, *B. bisulcata*, *Palaeonoto*.

7

34.45

10-15' hard, heavy bedded blue gray ss. Tendency to conchoidal fracture + storm-roller. This cut is 88 paces long. No fossils seen in it.

8.

34.60

3' conchoidally fracturing ss. Road goes N46W here for 258 paces

9.

34.7

10.

Cut 100 paces long flat moderately heavy-bedded ss breaking into slabs vary from an inch to several inches in thickness. From end of this cut road goes N25W 0.45 mi.



On sw side of road strike is  
 N5°E 10°NW. Small strom- 53  
 rollers. These rocks suggests  
 beds below lower falls at Napavich.

34.85

11

0.1 mile cut in dark blue  
 gray crumbly shaly ss. containing  
 brachiopods. *P. lanceolata*,  
*M. corbuliformis*, *O. parvula*,  
*Paracyclas*.

35.30

12.

35.35

Cut about 150 paces long  
 consisting of 10' of heavily bedded  
 blue gray, coarse ss. with  
 softer layers of black shaly  
 stone and soft ss. Only plants  
 seen. Dip about 5°N 20°W. At end  
 of this cut road swings N5°E  
 for 0.65 mi. Lane crosses road  
 at end of this cut.

35.40

13

On lower part of cut about 4'  
 heavy-bedded ss. irregularly  
 bedded. This is overlain by 10'-15'  
 of purple weathered shaly ss.  
 abounding in fossils:

*Schizophoria* c *Lindstroemella*

*Schuchertella* c

*Myassa arguta* c

The uppermost bed of the  
 ss abounds in *Palaeospirifer*  
*acuminatus*, & sp. *arkensis*

Cut 150 paces long

10'

*Schizophoria*  
*Palaeospirifer*  
 4'



35.55  
- 35.8 14 About 35' of heavy-bedded  
X-bedded ss. at lower part of  
section. Pebble bed about 25'  
above base. About 15' lens of  
green shaly material.  $N 65^{\circ} E 4^{\circ} NW$   
At top of this section comes  
6' dark shale turning to green  
35' above bottom of section  
along road comes a 6' bed of  
knotty greenish concretionary ss.

35.85-36.0 15 About 10' heavy-bedded X-bedded  
ss. with plants. Catskill type.

36.05-  
36.10 16 At this point road goes  $N 25^{\circ} W$   
for 0.2 mi. Then  $N 60^{\circ} W$  for 0.1 mile  
and forms the main street of W. Hurley.  
Same X-bedded ss as 15.



$$\begin{array}{r}
 75 \\
 \hline
 5200 \overline{) 3950} \\
 \underline{3600} \phantom{00} \\
 2500
 \end{array}$$

$$\begin{array}{r}
 1580 \\
 2 \\
 \hline
 3160 \\
 790 \\
 \hline
 3950
 \end{array}$$

$$\begin{array}{r}
 730 \\
 2 \\
 \hline
 1460 \\
 385 \\
 \hline
 1845
 \end{array}$$

$$\begin{array}{r}
 230 \\
 2 \\
 \hline
 460 \\
 365 \\
 \hline
 1925
 \end{array}$$



August 8

55

1045' feet from R.R. bridge on east side of West Hurley a lens of black shale  $2\frac{1}{2}$ -4' thick with Estheria.

At 1338' comes another Estheria bed. RR cut ends at 3950'.

A8- RR cut just NE of Catholic church and just E. of bridge over lane. At E. end cut is about 10' high & extends 160 paces west to bridge. Consists of dark flaky shaly ss & a few heavy beds of ss. The east end of this cut 1825' from the east end of the long cut.

On new road lane crosses new road and leads to house solitary house. Schizophoria bed lies 0.1 mile north of this lane and where new highway turns N50E.

Schizophoria bed discovered on lane opposite end of long RR cut. Putting the bed at about the 500' contour between the RR cut & the new road. Below the Schizophoria bed

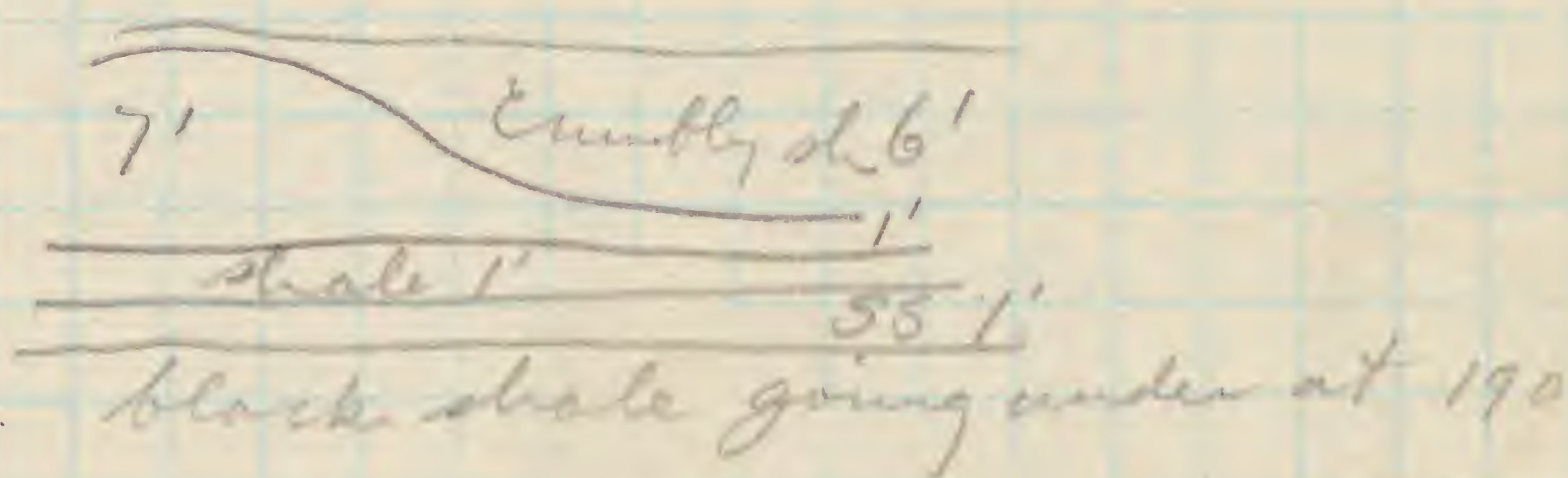
55  
Estheria shale  
55  
Schizophoria  
A8



which is about 9" thick + 58  
 9" of ss below with *Paraspinifer*,  
 there is a great display of  
 platy sandstone covering the  
 flat from RR bridge NW to  
 New road along the lane.

Tong RR. cut  
 East end + work N.

5' of crumbly greenish shale  
 overlain by 6" layer of heavy bedded  
 quartzitic ss. In 58 paces heavy  
 layer at track level. Followed by  
 9" shaly bed 2 1/2' heavy ss., 3' crumbly  
 bed and then by 2' heavy ss. At 123  
 paces upper bed at track level.  
 Then comes about 5' shale, dark  
 crumbly which goes under at  
 190. Here is following section



At 222 shales disappear + ss comes  
 in by wedging. About 70'.

At 351 paces 10' ledge at track level  
 followed by olivaceous beds which  
 disappear at 463.

At 600 cut is 30' high with many  
 dark shales.

at 819 top of 30' ss at



R.R. level. & 70' shale dark comes in. At 870 shale passes laterally into ss. From here to 1080 on W side tracks dark shaly ss & ss lens in and out continuously. It would be impossible to make a section. Cut here about 30' high. Lowest *Estheria* bed is 5' above tracks at 1080.

1147 lowest *Estheria* goes under. W. 6-7' thick at thickest. About 12' of ss above 1st *Estheria* comes. Thin edge of second *Estheria* lens about 6" thick. At 1185 2nd *Estheria* bed is 7' thick. At 1220 ~~cut for~~ 2nd *Estheria* bed thins out.

At 1366 About 5' above tracks is 5' of olive shale with *Estheria*. This bed disappears at 1428 approx. Cut ends at 1568. Bridge at 1650.

In West Hurley 1/2 mile East of Woodstock road is crumbly green beds. 0.05 mi. East of Woodstock road small cut in olive shale & ss.







A8<sup>2</sup>

RR Cut  $\frac{1}{2}$  mile West of  
Woodstock Road in West  
Hurley.

58

East end cut 15' heavy bedded  
green gray ss., X-bedded. This bed  
is at track level in 164 paces  
Above it are 2' mottled green + red  
crumbly shales followed by 7'  
crumbly green rock, + 10' X-bedded  
ss.

At 219 paces top of green shale  
is a RR level.

At 307 paces 10' (probably 15' ss  
is at track level. Here it  
is overlain by 20' + of red crumbly  
shale. Dip is about 60 N 50 W. The  
RR track goes about down dip.

At 477 paces the 20' of red beds  
is at track level with 8' green  
beds above then 2' ss, 10' green  
beds and a ledge of 10-15' ss  
forming top of cut.

At 577 paces all colored shales  
at track level + base of ss  
here 20' thick.

At 717 thick ss at track level  
and capped by 5' ~~ss~~ red  
shales. Cut ends.

A8<sup>3</sup> - RR cut in 10' red + green shale



A84 Went up road to Ohaya (Ohio) Mtn. Good exposures at summit but only of reds & greens and green coarse ss. Saw no fossils other than plants

August 9.

dark sh	6'	fossils
green ss	3-4'	
sh	?	

Small quarry in continental beds. In a black shale just above road level came small clams, ostracods & Estheria.

A91 - Qy in 25' green shaly ss. & dark sh. no fossils seen. Run up to bend in Road.

A92 - X-bedded ss.

A93 - Spillway channel floored by red & green mottled sandy sh., sh., and ss. About 100 yds below bridge rocks tip sharply with strong dip to SW. Rocks at bridge dip about 4° SW.



A94 - Section along branch of  
Esopus Creek - 60

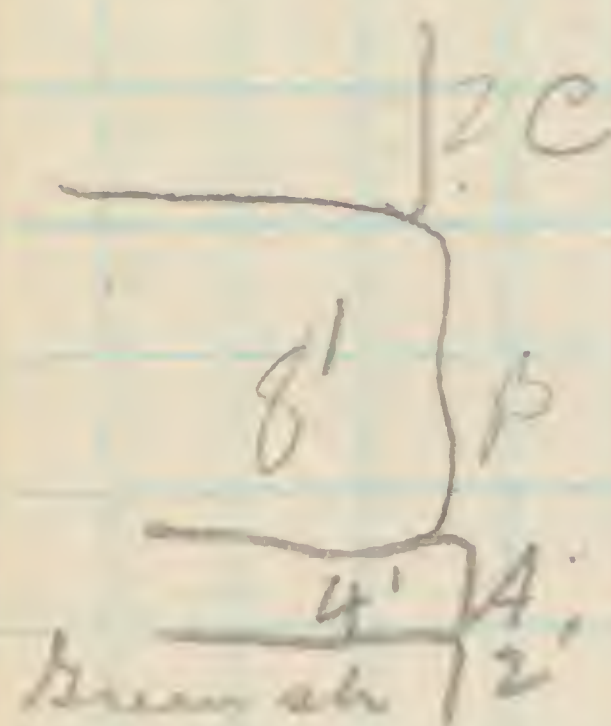
A - Dark sandy sh. with *Archaeopteria*  
passing into ~~to~~ bedded ss. 4'

B - Mottled red & green sh. - 8'

C. Upper bed of mottled red & green  
thickness.

This section is covered for  
about 20'. 60' above entrance  
at about ~~470~~ or at 480 comes  
dark shales with *Estheria*. Below  
the *Estheria* are 15-20' of dark  
sh & green & red beds. The  
*Estheria* bed overlies about 6" hard  
ss.

15' above the *Estheria* bed  
comes another at 495' just  
a little below the bridge.  
Probably Chadwick's Oak Hill bed.  
These shales are sandwiched  
in between greens. Beds dip toward  
lake to NW.





A95 small exposure crumbly green sh. + olive hard shale. 61

A96 - Bright reds bright Green shale & ss.

A97 Spillway channel, great bed, 20' +, x-bedded with plants & limonite concretions. Base rests on 5' bed green shale and dips  $5^{\circ}$  N  $80^{\circ}$  W. Upstream dip steepens to  $11^{\circ}$  N  $75^{\circ}$  W. Ss. overlaid by crumbly green shale 2' and 5' olive dark shale.

More sandstones appear downstream from bridge. Excellent locality for study of ss.

Went from dam just above Olive Bridge to Bloodhead, west Shokan and end of lake around to Boiceville and Shokan. Only one good exposure seen & this was of reds and greens. Drove from Shokan to Lomontville. From spillway channel for about  $1\frac{1}{2}$  mi. x-bedded ss are prominent and beside the road. They then give way to softer rock very poorly exposed which is undoubtedly Hamilton.



0051  
0071  
0071  
0071  
0071

002  
0021

2457





A10 - Red, green shales, 2 heavy beds x-bedded ss. upper one at intersection 62

A10' - dark green and green shale + shaly ss. in small pit 3-4'. N17E 6 1/2 NW.

A10<sup>2</sup> on hill about 20' heavy-bedded ss including dark shales at bottom + top! Some shale is dark green.

A8<sup>4</sup> - revisited At 1105' on Ohio Mt. in a quarry at roadside in red beds is a 4" hard calcareous band with fish-plates + ostracods. Dip component  $\approx 2^\circ$  N84W. Cliff on S side Ohio Mt. about 100' above saddle.

A10<sup>3</sup> - overlying x-bedded ss., about 10' hackly mottled shale, and olive sandy shale.

10<sup>4</sup> Roadside exposures of x-bedded ss. dark olive shale + hackly mottled reds + greens. No fossils other than plants.

A10<sup>4A</sup> Dark sandy shales with plants dipping west. Strike N40E 5° NW.



Send Mr. Zimm *Parazyga hirsuta*  
63

Coral ledge in Mt Marion on east  
side bridge. Find out about  
U.S. map for Mr. Zimm.  
Ask Mrs Zimm for a Charionella

A10<sup>5</sup> Cut 300 paces long. At  
base green gray and nearly  
black shales in 2 beds 2 1/2'  
thick separated by a sandstone  
8" thick. Then follow dark  
shaly ss + x-bedded ss.  
about 30' thick in a quarry  
1/2 the length of the cut. In  
red shale bed Estheria was taken  
N33E 10° NW







A11- Outlet of lake - 25-30'  
X-bedded greenish gray ss.

A11'- 15' X-bedded ss.

A11<sup>2</sup>- 8' X-bedded ss with  
plants. All 3 exposures of  
Ashokan type.

A11<sup>3</sup>- 6'-7' dark smooth shales  
overlain by 12' X-bedded coarse  
ss with plants.

A11<sup>4</sup>- lowest reds.

A11<sup>5</sup>- Reds.

A11<sup>6</sup>- Reds in stream-bed Dip N25°W3°  
Above stream 0.1 mi. at old Zena  
Mill. lens of X-bedded ss.

A11<sup>7</sup>- X-bedded ss.

A11<sup>8</sup>- 5' dark fine-grained ss. with  
shaly cleavage & turning dark red  
on exposure, overlain by 4' crumbly  
reds.

A11<sup>9</sup>- dark shale (olive 2') overlain  
by X-bedded ss. 5'

A11<sup>10</sup>- X-bedded ss. 5'

A11<sup>11</sup>- Reds capped by X-bedded ss.



A11<sup>12</sup> - Reds

65.

A11<sup>13</sup> - X bedded ss in Saw Kill  
dipping NW.

A11<sup>14</sup> - 6' mottled red + green shale  
overlain by 10' X-bedded ss.

A11<sup>15</sup> - Quarry in 15-20' X bedded ss  
with *Eospematopteris*

A11<sup>16</sup> - 10' red + green mottled shale  
overlain by 3' X-bedded ss.

A11<sup>17</sup> - About 20' red + green beds  
N50E 10°NW.

A11<sup>18</sup> - 6' dark + green shales with  
*Estheria* + *Ostracods*. 0.8 mile from  
junction with.

A11<sup>19</sup> Flagstone Qy 8' X-bedded ss  
Sandstones well exposed  
along Road from West Hurley S for  
about 3/4 mile.

A11<sup>20</sup> hard calcareous rock of  
Lower Mt. Marion 25' vertical  
S87W 5°NE,

A11<sup>21</sup> - hard shaly ss. crumpling to  
dark chips with hard layers  
one of which contains *Schizophoria*  
dip here seems to be toward road







A11<sup>22</sup> Small cut in hillside 70' over road. Dark gray shale weathering light gray & containing *L. limitare*

A11<sup>23</sup> blocky shaly dark, crumbly ss. with *Stylidina*

A11<sup>24</sup> - 30' cut in dark gray crumbly ~~sh~~ sandy shale with *N. tiqueter* *S. fissurella*

A11<sup>25</sup> - soft crumbly sandy sh separated by several ss. beds about 6" thick. N35° E6° NW. Small concretions size of egg.

A11<sup>26</sup> - section up Halihan Hill

190'  
Elevation  
of top of  
hill wrong  
here. The  
hill is 30'  
too high.  
Add 30'  
Spread  
30' into  
section

Lowest 5' in soft gray shale  
Then comes a 2' bed of finer, leached  
olive shale containing *Sp. andaculus*,  
*E. fimbriata*, *Atrypa*, cup corals etc.  
This may be same zone as top of  
Berne but attenuated. Above  
this are soft shaly rocks for 7'

205-220 Covered

220-225 - soft shale with *Leiorhynchus*

225-225 1/2 - harder sandy layer  
with *Sp. ~~macronotus~~*, *Atrypa*,  
*Sp. andaculus*

225 1/2 - 240 - some dark gray sh  
with small concretions abundant  
at top. *Grammysia*







240-260 - Covered

260-290 - shaly ss becoming coarser & finer. At 290 is a 6" layer containing *Sp. granulosa*? type of large *Sp.*, *Athyrid*, *M. concentrica*. Above this are about 20' alternating shaly soft ss. & hard flaggy ss in layers 6" to a foot thick. This is followed by about 10' of irregularly bedded ss. 310 comes *Sp. undatulus*? At 320 comes the harder coarser upper beds to the level of the road. No fossils in these  
N 5° E 5½° NW

290-320 - section above

320-330 - heavy, massive blue gray ss with storm-rolled structure. These are overlain by 5' of shaler darker ss.

330-335 - darker ss. overlying heavy bedded ss mentioned above. *Mucula* & *Muculites* at top.

335-340 - covered

340-347 - dark crumbly shales interbedded with coarse blue gray ss. At top *N. arguta*, *L. aspidium*, *T. carinatus*, *C. coronatus*, *Sp. granulosa*, *Leiopteria*, *M. concentrica*

347-370 - crumbly shaly ss with thin ss. bands.  
A ss ledge 6" thick at 360 and filled with *Leiopteria*  
gone N 23° E 5° NW



At 360 a thin ss. with  
*Sp. nummatus*, *J. carinatus* At 370  
*Cones C. coronatus* & large *Camerotheca*  
 370-380 - covered and *Paracyclus*  
 380 - *Cones* heavy ss ledge opposite  
 first house. Plant fragments

X-bedded ss. at top of hill  
 opposite house on N side road.

About 150 paces east of road  
 intersection about 6' irregularly  
 bedded, contorted ss breaking into  
 thin plates. This becomes heavier  
 bedded down slope to turn just  
 east of third house on S side  
 road.

Quarry located 100 paces W  
 of 3rd house on S side road.  
 Quarry consists of a heavy 4'  
 ledge at base with alternating  
 shaly thin sands & heavier bedded  
 ss. The upper ss. split into very  
 thin pieces & are dark & shaly.  
 Fossils in dumps:

*B. circularis*

At 76 paces farther west is a  
 5' ledge of heavy bedded ss.  
 200 paces farther west a 10'  
 massive ledge.



1639

August 12

A12

69

Swest slope Halihan Hill

at 255' about 8' crumbly dark  
ss. passing into harder +  
heavier-bedded ss. with a 2'  
storm roller bed at top. No fossils seen.  
263-275 covered

275-281 - fairly heavy bedded  
blue gray ss. in layers 3" thick  
passing into shaly rock at top.  
Faunally,

281-295 covered

295-305

shaly gray ss. N51E30NW.  
passing upward into storm-roller  
beds.

At 345 Quarry in shaly ss  
with heavy storm rollers + lenses  
of ss. Quarry about 15' high  
304-400 mostly covered. 13' storm-  
roller bed just under 400.

100 paces N of first road east  
15' x-bedded ss. and continues as  
a ridge for 200 paces. At about 300  
- 350 paces comes a borrowing pit  
in shaly ss.

A12' - irregularly bedded dark  
shaly ss. dipping upstream  
about 15°. Without fossils. Probably  
corresponds to similar nearly  
barren beds in the vicinity  
of Stony Hollow. Stream goes



1640

About up the dip here

70

A 12<sup>2</sup> - long cut in blue dark gray sandstones containing *Paraceras*. The shaly ss. are about 7' thick and are followed by about 3' storm-roller. Just below the storm-roller a loose piece of hard ss. had *C. coronatus*, large *Camarotoechia*. The piece is very fresh but may not be from this ledge.

A 12<sup>3</sup> - Moderately heavy-bedded blue gray ss.

A 12<sup>4</sup> - Heavy bedded ss. in stream forming rapids. Large pebbles 1 1/2"

A 12<sup>5</sup> - x-bedded, heavy-bedded ss & shaly ss.

A 12<sup>6</sup> - on roadside knobby beds followed by olive shales and heavy bedded ss. exposed on roadside and in quarry.

A 12<sup>7</sup> - dark shale & shaly ss.

A 12<sup>8</sup> - 50 yds downstream in a hard layer about 1' thick come many corals, possibly representing top of Berne. Same bed as at base of Halihan hill section A 11<sup>26</sup>



6

400  
200

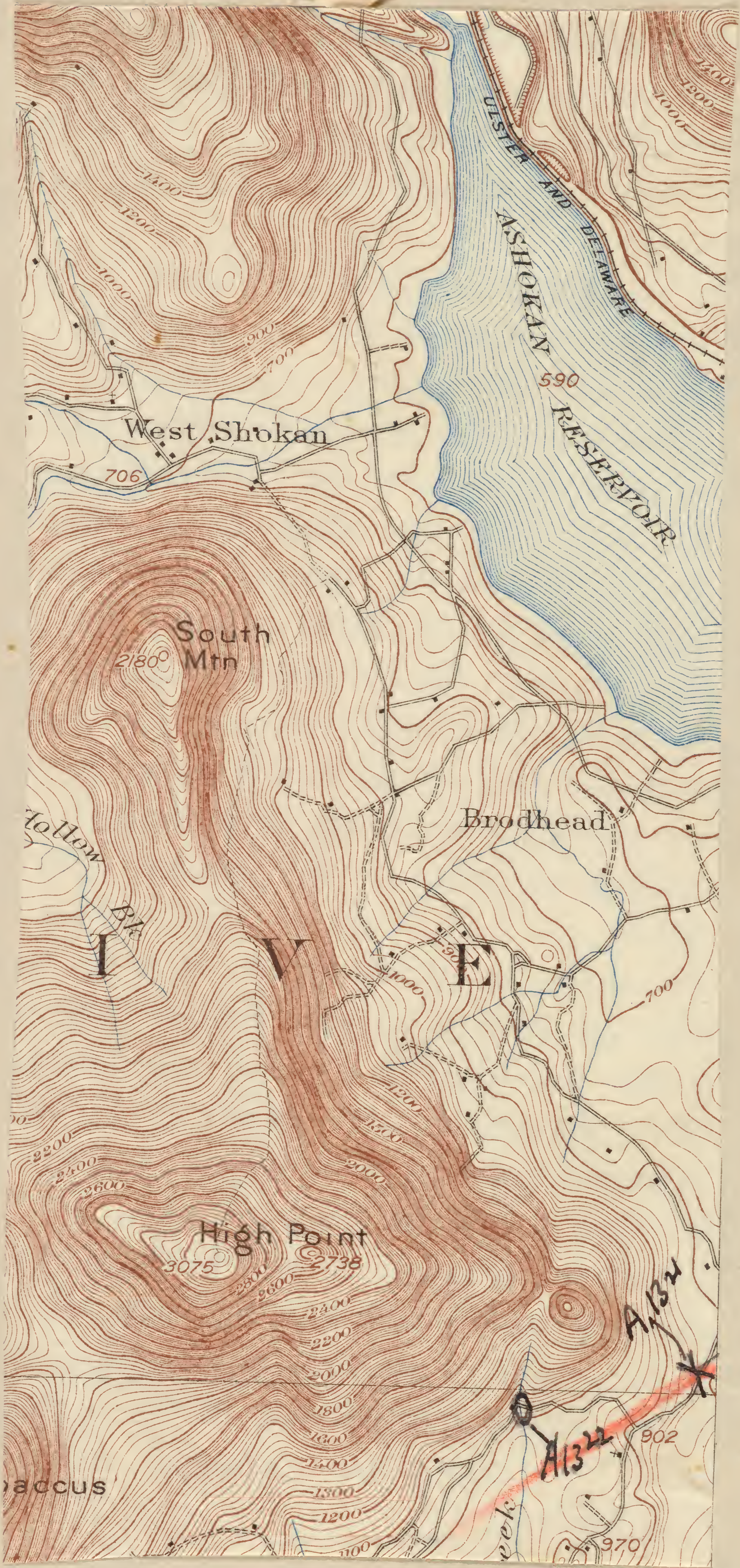
400  
200  
1100  
1500  
2600  
2000

2575

450  
1500  
2000  
3950









Coral bed culminates in a zone of <sup>sp. andaculus</sup> ~~mainly~~. Some 30' above the coral ~~corals~~ another layer abounding in *sp. andaculus*. At Bridge are about 75' of soft sandy dark shales with thin hard ss layers. These are same as those seen over slope of Holihan Hill. N15E 4 1/2° NW. St

A12<sup>9</sup> — Large flagstone quarry. Rocks become progressively harder to west. This zone must be near beds from top of Mt. Marion

A12<sup>10</sup> — hard beds of lower Mt. Marion same as exposed in cut just outside of Kingston. This bed is about 150' This also appears at intersection of road at Mt. Marion N10°E 11° NW measured at Dam.

A12<sup>11</sup> — Small cut in sandy sh. *Sp. micronatus*, *Sp. andaculus*, *P. flabellum*.

A12<sup>12</sup> — cut in soft sandy, crumbly shale with *Sp. micronatus*.

A12<sup>13</sup> — Soft crumbly sandy shale above hard beds. About 30' high

A12<sup>14</sup> — Hard closely cleaved Lower Mt. Marion. Cleavage strikes



0.4





A 12<sup>15</sup>  
A 12<sup>14</sup>

N 25° E 75° S  $\frac{1}{2}$ . Fossils

A. spinosa, fine-lined Atrypa, Productella, Schizophoria, Dechenella, Pentamerella new. This is same bed as A 11<sup>24</sup> and what was called Leiorhynchus at that place is the small Pentamerella. From this cut A 12<sup>13</sup> can be seen due west across the valley. This is probably near the top of the hard layer. These hard beds dip  $\frac{1}{2}$  8 1/2° N 75° W. This hard layer probably should have a name as it extends from Catskill to Pennsylvanian. I believe the beds just W. of Catskill also belong to this layer.



1000'



1643

Gas 5 gal. - 0.93

August 13

73

A13- Beside bridge (south) over RR section of 25' of hard cleaved calcareous rock of lower Mt. Marion with small corals & Cratopora. Great blocks & sheets of rock drop off cleavage surfaces. There must be 3 or 400 feet of this rock exposed here. This is a good location for a type section. In the RR cut just below the bridge the rock becomes softer ~~and~~ but still holds the strong cleavage N 70° E 13° NW. These rocks are exposed for some 0.2 mile.

A13<sup>1</sup> - Waterfalls over 45-65' hard rock. N 53° E 4 1/2° NW

N 15° E 9° NW

A13<sup>2</sup> - Hard bed dipping 8° N 45° W 0.2 mile from ~~brook to~~ A13<sup>2</sup> cliff showing excellent weathered surface. - Picture

A13<sup>3</sup> - Top of hard bed at 145 feet over valley road. N 78° W 4° NW putting top at 320'. Makes thickness at least 200'

A13<sup>4</sup> - 40' cliffs in hard bed dipping 3 1/2° N 25° W. Picture Excellent cut for 0.2 mile



A 13<sup>5</sup> - top of hard bed

A 13<sup>6</sup> - soft sandy sh.

A 13<sup>7</sup> - About 30' soft sandy, concretionary shale with *Trinobolites*, *Sp. numeratus*, *Sp. andaculus*, small *Chonetes*.

A 13<sup>8</sup> - firm, lumpy shaly ss. no fossils

A 13<sup>9</sup> - 10' Crumbly dark shaly ss. of Cardiff type

A 13<sup>10</sup> - lumpy, hard, heavy bedded shaly ss. with *P. liata*. Includes waterfalls over same rocks.

A 13<sup>11</sup> - Ascent into Lopla shows ss + storm-rolled beds.

A 13<sup>12</sup> - Rocks become increasingly sand to end of settlement of Lopla where there are big flagstone quarries

A 13<sup>13</sup> - large high falls over ss same as A 13<sup>10</sup>. N 40° E 60° NW.

A 13<sup>14</sup> - Mx. Marion hard bed

A 13<sup>15</sup> - " " " "

A 13<sup>16</sup> - " " " "

A 13<sup>17</sup> - " " " "

A 13<sup>18</sup> - 10' - 15' soft crumbly sandy shale



A13<sup>19</sup> - Dark + greenish sh + knotty ss. capped by a bed of ss 2' thick with *Tentaculites*, *Sp. pinnucronatus*, *T. carinatus*. The dip is  $6^{\circ}$  N  $7^{\circ}$  E.

A13<sup>20</sup> - Small quarry in 20' smooth fine-grained heavy bedded ss. overlain on road further house by 5' X-bedded ss.

A13<sup>21</sup> - About 3 miles NE. of Samsonville quarry with large dump. Black sandy rock in dump contains *Eothenia*. Dy about 15' high with much black shale + containing X-bedded ss.

A13<sup>22</sup> - X-bedded ss about 30' in glen Dark shale + greenbeds by side of road 10'.

Drove road from Samsonville around base of Mtz. to Mombaccan saw no good exposures.



of importance relating, for example, to irrigation, or reclamation of swamp areas—are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{31,680}$  (1 inch = one-half mile), with a contour interval of 5, or 10 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{63,360}$  (1 inch = nearly mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{126,720}$  (1 inch = nearly 2 miles), with a contour interval of 25 to 50 feet.

A topographic survey of Alaska has been in progress since 1898, and nearly 43 per cent of its area has now been mapped. About 10 per cent of the Territory has been covered by reconnaissance maps on a scale of  $\frac{1}{625,000}$ , or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of  $\frac{1}{250,000}$ , but about 4,000 square miles have been mapped on a scale of  $\frac{1}{63,360}$  or larger.

The Hawaiian Islands, with the exception of the small islands at the western end of the group, have been surveyed, and the resulting maps are published on a scale of  $\frac{1}{63,360}$ .

The features shown on these maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture







The United States Geological Survey is making a standard topographic atlas of the United States. This work has been in progress since 1882, and its results consist of published maps of about 42 per cent of the country, exclusive of underlying features.

The topographic atlas is published in the form of maps on a scale of about 1 inch by 20 miles. Under the general system adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in development of the country, and consequently, though the quadrangles are of nearly uniform size, they represent areas of different sizes. On the lower margin of each map are printed the scales showing distances in feet, inches, and miles. In addition, the scale of the map is shown by a fraction expressing the ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale  $\frac{1}{62,500}$  means that 1 inch on the map (such as 1 inch, 1 foot, or 1 mile) represents 62,500 similar units on the earth's surface.

Although some areas are surveyed and some maps are revised and published on special scales for special purposes, the standard topographic surveys for the United States proper and possessing maps have for many years been divided into three classes, differentiated as follows:

Surveys of areas in which there are problems of great importance, such as the problems of mineral development, irrigation, or reclamation in swamp areas—are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{62,500}$  (1 inch = one-half mile), with a contour interval of 10 feet.

Surveys of areas in which there are problems of average importance, such as most of the basin of the Mississippi and the basins of the Colorado and the Rio Grande—are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{125,000}$  (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

Surveys of areas in which the problems are of minor importance, such as much of the mountain or desert area of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{250,000}$  (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

The topographic survey of Alaska has been in progress since 1898, and nearly 43 per cent of its area has now been mapped. About 15 per cent of the Territory has been covered by reconnaissance maps on a scale of  $\frac{1}{250,000}$ , or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of  $\frac{1}{625,000}$ , but about 4,000 square miles have been mapped on a scale of  $\frac{1}{125,000}$  or larger.

The Hawaiian Islands, with the exception of the small islands at the western end of the group, have been surveyed, and the resulting maps are published on a scale of  $\frac{1}{62,500}$ .

The features shown on these maps may be arranged in three groups: (1) water, including sea, lakes, rivers, creeks, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture

(works of man), such as towns, cities, roads, railroads, and boundaries. The symbols used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue. The smaller streams are shown by single blue lines, and the larger streams, the lakes, and the sea by blue water flowing or blue flat. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are emphasized by hachures, showing the effect of light thrown from the north-west corner. The lines are represented for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground at constant every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the sea level, itself, is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitudes. Successive contours from that for the sea level to the





1846

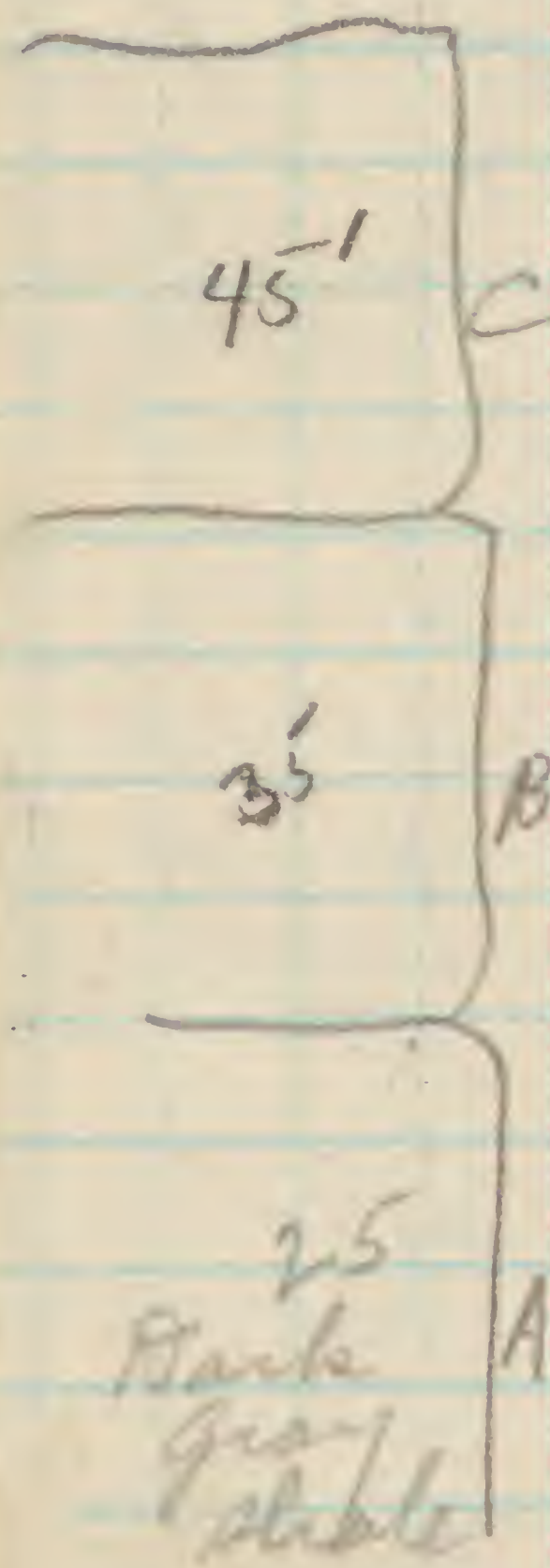
August 14

76

Large cut in lumpy sandy shale with concretionary structure. Contains a number of thin 6" ss. beds. N 22 E 11° NW. Ambocoelia, Pterygia, Myassa, Palaeoniscus Sp. mucronatus, Chonetes

A 14' - 4' lumpy shale followed by quartz pebble bed 3" thick followed by 1' heavy bed ss. With pebbles + just above them are Camarotoechia, Pterinea Sp. mucronatus.

A 14<sup>2</sup> - Wesley Hanks farm - Old Coal Mine.

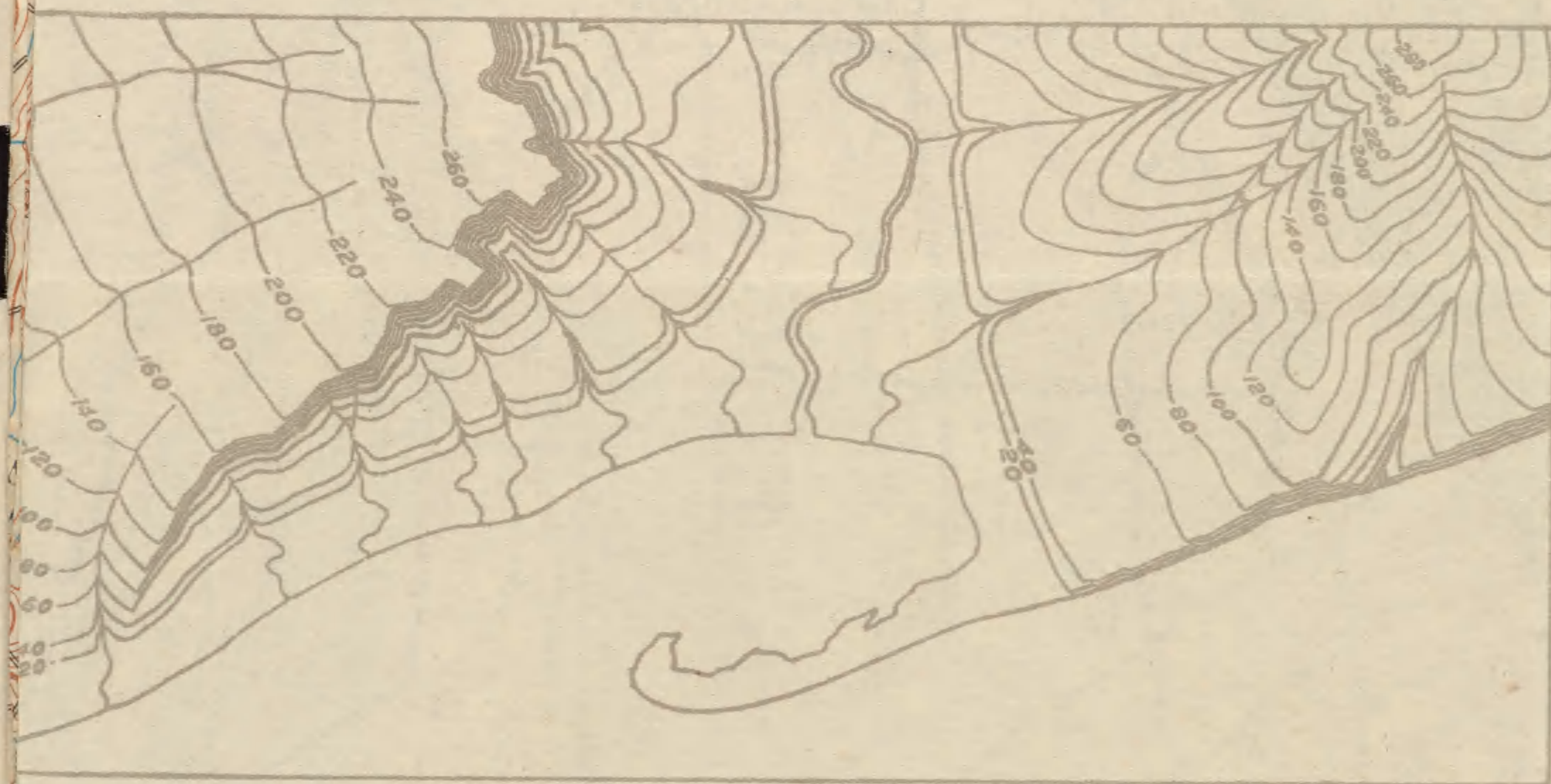


A - Some 25' hard dark gray shale much deformed + slickensided in bed of stream at contact with B. Shaft for coal sunk into slickenside material.

B. - 35' feet, hard shaly sandy rock, heavy bedded rock, flat bedded (platy, not greatly cleaved). This is beginning of hard layer dip is 9° N 55° W.



and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly enclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently slop-







# GRAPHIC MAPS OF THE UNITED STATES

works of man), such as towns, cities, roads, railroads, and boundaries. The symbols used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, the lakes, and the sea by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the sea coast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the more line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff.

The manner in which contour lines express altitude, and grade is shown in the figure below.



The sketch represents a river valley that lies between hills. In the foreground is the sea, with a bay that is enclosed by a hooked sand bar. On each side of the valley a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping sides.

## STANDARD SYMBOLS

### CULTURE (printed in black)

Road	Railroads	Electric railroad	Tunnel	Power transmission line	Wharves	Enclosed and planted land	Bridges	Power lines	River
State line	County line	Civil township or district line	Reservation line	Land grant line	City limits or borough line	Rural precinct or township line	Triangulation point or survey station	U.S. mineral reservation	
Timber and oil reservations	Oil and gas wells	Mine or quarry	Prospect	Shale	More ground	More ground (containing oil reserves)	Abundances of forests	U.S. mineral reservation	

### WATER (printed in blue)

Stream	Falls and rapids	Intermittent streams and ditches	Canals or ditches	Arched structures or bridges	Irrigation canals	Lakes or ponds	Low-lying areas or swamps		
Bay or inlet	Estuary	Glacial lake	Well	Marsh	Submerged land				

ing space separated by ravines. The spurs are indicated their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep escarp, from which it slopes gradually away and forms an inclined table-land that is crossed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in sketch, by contour lines.

The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the country mapped: in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 200 feet. For contour lines, every fourth or fifth one, are made heavier than the others and are accompanied by figures showing altitudes. The heights of many points—such as road corners, summits of hills, and bench marks—are also given on the map in figures, which show altitudes to the nearest foot only. The exact altitudes—those of bench marks—well as the geographic coordinates of triangulation stations, are published in bulletins issued by the Geological Survey.

Lettering and the works of man are shown in black. Boundaries such as those of a State, county, city, land grant, township, or reservation, are shown by continuous or broken lines of different colors and weights. Good roads or public roads



C. Hard "calcareous" rock. 45'  
Figures do not give true thickness  
as beds dip  $9^{\circ}$ . Contact of sh &  
calc rock is 80' below road.  
Just under contact is sooty  
shale mined for coal. 35-'  
Transition interval only  
difficultly separable from  
upper 45'. Separation is  
questionable

A14<sup>3</sup>, A14<sup>4</sup> - Calcareous hard bed  
of Lower Mt. Marion ~~A14<sup>4</sup>~~

A14<sup>5</sup> - Beds just below hard layer  
& transitional to it.

A14<sup>6</sup> - hard layer of lower Mt.  
Marion

A14<sup>7</sup> - hard layer  
A14<sup>8</sup> - " "



1648

August 15

78

A15 - 0.15 miles NE of Great Falls comes  
lumpy, sandy shale with irregular  
fracture capped by 1-2' hard ss  
with many fossils. N13° E 8° NW

Small Leptostrophia

*P. acuminatus* a.*P. flabellum**Sp. andaculus**Chonetes coronatus**Leptostrophia**Sp. mucronatus**L. nodocostata**L. macroptera* below falls

The soft material under Para-  
spirifer extends about 0.1 mile  
NE up road. This Paraspirifer  
bed forms the hard layer  
responsible for the falls.

A15' - Great Falls - about 40'  
high. Two hard ledges in Falls:  
Lowest ledge about 15' above  
bottom. Middle bed of softer  
lumpy shaly ss. about 15' high  
upper bed of 10', hardest at top  
where it is somewhat lumpy  
and contains Paraspirifer.

Downstream A thickens to about  
feet.



Bed D above falls 65-75' high  
consisting of flags 6" thick  
alternating with shaly rock.

A - contains: *Schizodus*, *P. luata*,  
large rounded *Chonetes*. Bed  
A extends downstream for



about  $\frac{1}{20}$  mile and exposes a thickness of about 100' of the dark sandy crumbly shales.

In the *Paraspirifer* bed a species of *Taonurus* is abundant. The *Paraspirifer* bed strongly reminds of the Silica shale. The sp. *mucronatus* suggests the sp. *prolifera*, the *Paraspirifer*, *P. bowenockeri* etc.

The upper 2' of bed forming base of falls also contains *Paraspirifer*.

*Paraspirifer* bed forming falls strikes  $N 12^{\circ} E$  and dips  $10^{\circ} NW$ . Other fossils seen in these upper beds are *Douvillina* small *Schizophoria*, *Palaeoniscus* *femistriata*, *Pal. emarginata*. *M. concentrica*

Section upstream -  
For 0.1 mile the section is alternating beds of blue gray sandy shale alternating with ss beds from 6" to 1' thick & shell beds up to 10' thick 0.05 miles farther upstream where shales become sandier & ss more frequent fossils occur in the ss: *G. carinatus*, large *Camerothechis* sp. *prolifera*



At bend of road comes about 15' rock exposed for about 100 paces abounding in fossils: 80

Paraspirifer	Devonaster
Large Camarotoechia	Paracyclos
Leptostrea large	S. magna
C. coronatus	

Section consists of storm-roller zone 2', Shaly ss. with Camarotoechia & Chonetes coronatus 4' Coarse ss. with Leptostrea 89'

Then comes more shaly rock. The ss are followed by 10-15' shaly rock with C. coronatus, P. flatellum, P. striata, Nyassa, S. circularis

About 150 paces upstream from bend in road are 4' sandy shales overlying hard ss abounding in C. coronatus. and about 1' below this layer many Camarotoechias are present. 70 paces further on G. carinatus is common.

Rock extends upstream to dam, 225 paces upstream from bend of road. Rock at dam on opposite of creek as could not see it. About 100 paces below dam came Spirifers in rock not far out of place and these were the fossils seen although they may be present at dam







1651

A 15<sup>2</sup> — hard bed N24E 18° NW.

A 15<sup>3</sup> — hard bed

81

A 15<sup>4</sup> — small patch thin-bedded ss  
with Nuculites, Triguaster, Ostreolites  
Camarotoechia

A 15<sup>5</sup> — Flags with Nuculites  
oblongus. Plants. Spiniferoid

A 15<sup>6</sup> — Flags.

A 15<sup>7</sup> — Two waterfalls, upper one  
100 yds. East of corners, second one  
about 0.15 mile downstream  
second falls over hard band with  
sp. granular type, Camularia

A 15<sup>8</sup> — About 15' hard sandy  
rock getting softer for 10'  
downward. Then 15' harder  
beds at bottom. Dip on top  
N 20° E 29° NW. Fossils occur  
here Schizophoria, Atrypa, small  
Pentamerella.



See Crosby on Keystone  
Faults - Parking just over bridge

82

August 16

Webber Bridge

~~Webber~~ Bridge - Just upstream  
from bridge ledge of Onondaga  
limestone striking  $N 35^{\circ} W / 19^{\circ} SW$   
Above the limestone comes an  
inch of black shale, then  $\frac{1}{2}$  inch  
crinoidal ls., a thin shale seam,  
then 1" of limestone black &  
crinoidal. Above this come black  
shale, with brown streak and  
weathering to thin red rusted  
flakes. Contains *Limnites*, *Styliolina*  
Chadwick estimated 75' of black  
shale here. Contains one layer  
of concretionary dark limestone  
Upstream toward the end of the  
cut the dips are irregular & the  
beds much distorted.

This section I think represents  
the Union Springs, and the  
hard layer may equal Cherry Valley.



1653

Section in Kaaterskill Clove  
 A 16' - Segment from bend in new road below Kaaterskill Falls to 83 Haines Falls village -

Bridge over brook below Kaaterskill Falls is at 1490'. Rock is exposed below bridge for 30'. Lowest rock

A - mottled green + red in brook at base of falls - 1' -

B - Heavy-bedded massive greenish ss. forming lower cascade 35'

C - Red beds - 15'

D - Heavy-bedded ss 10'

E - Covered 40' +

F - Red beds 15'

G - Heavy-bedded ss with tree ferns, N 7° W 7° W 35'

H - Red beds 20'

I - Heavy massive x-bedded green ss. base at 1642' - 75'  
 Contains scattered pebbles.

J - red beds, with green lenses <sup>Knobby</sup> at top 11'

K - hard x-bedded ss

L - green ss. passing laterally into reds, with reds above 35'

M - Heavy massive ss 30'

N - Knobby red shale in waterfall - 20'

O - X-bedded ss. 5'

P - Red beds, with 1' green sh at top 20'

Q - X-bedded green ss. conglomeratic with scattered pebbles + 10' sandy shale at base. Mud congl. in middle 1/3 45'

R - red shale 1790' 3'

Covered to RR + road crossing in

385  
 120  
 265



1920  
1740

Haines Falls, 130' plus dip.

84

Section from Mountain House  
to Summit —A — Mountain rests on a ledge  
of X-bedded ss.B — Red ss + shale ending in 1'  
knotty green rock. Possibly bed P. 60'  
of preceding section.C — X-bedded ss, large pebbles in  
base. This may be same as ~~bed~~  
bed Q which contains black  
sandy shale near base  
and in lower part 30'

D — Red beds —

E — Heavy ledge conglomeratic  
ss. <sup>small</sup> Layers of pebbles 2 or 3' — 40'F — Covered probably in red  
shales + ss. — 40'G — Massive conglomerate, base  
of Mr. Chadwick's Haines  
Conglomerate. Pebbles large  
of quartz + ss. up to 10" — 25'Upper part of ledge consists  
of coarse ss.



14 - Mostly cross-bedded ss with scattered pebbles of large size and lenses of conglomerate — 45' 85

d - Conglomerate with pebbles becoming sparser at top — 10'  
This is the very summit of the hill.

### Section below Kaaterskill Falls

0.35 miles down from falls and at 1350' are heavy-bedded ss. about 35' shown beside the road but with a heavy ledge of about 50' above the 35' ledge. Some dark green shale contains plants.

At next crossing of creek & road 1.45 miles below Kaaterskill falls creek and at 980' comes a great cliff about 100' high. Lowest bed is a 15' ledge heavy-bedded ss containing thin layers of red & green shale and a piece of *Cospermatoxaris* 3' below top. This is succeeded by dark greenish sandy shale which turns red laterally — 15'

End of section here about 0.1 mile below bridge

10475  
10513  
1.45



Then comes 8' knobby red beds followed by 40' red beds with sandy layers. This is followed by a 40' + 50' ledge of X-bedded ss. 200 paces upstream the upper ss ledges form a falls 20-30' high. Below the bridge 15-20' of red shales are exposed. This section dips about 5° N 75° W.

Aug 17

### Meads to Summit of Overlook Mtn.

1715 - 1780 - Covered

1780 - 1800 - ledge of X-bedded ss.

1800 - 1805 - covered

1805 - 1812 - X-bedded ss with plants

1812 - 2260 - covered

2260 - 2290 - X-bedded ss.

2290 - 2390 - covered

2385 - 2390 - hard red shale.

2390 - 2430 - Covered

2430 - 2440 - Red shaly ss.

2440 - 2445 - X-bedded ss.

2445 - 2448 - Congl. with quartz

2448 - 2452 - X-bedded ss.

Mr. Chadwick believes this congl. correlates with the lower one above the Mtn. House. The one has smaller pebbles & many clay pebbles.



2452-2535 - covered

2535-2553 - X-bedded ss.

2553-2595 - covered

2595-2610 - Red shaly ss.  $7^{\circ}N50^{\circ}W$

2610-2780 - covered

2780 - 40' left of road about 20'  
X-bedded ss.

2780-2895 - Ledges of X-bedded ss  
at 2900 behind hotel is a quarry  
in conglomeratic ss. Scattered on  
road below old hotel are  
thick boulders of coarse conglomerate  
like that above the Mt. House

At 2960 strike  $N50^{\circ}E2^{\circ}NW$

Top ledge of Overlook is 15' of  
X-bedded ss underlain by red shale.

Coarse conglomerate blocks here  
appear to be ~~float~~ glacial drift.  
If so the conglomerate which  
correlates with the Congl. above  
the Mt. House is not present  
on Overlook Mtn.

Mr. Chadwick thinks that  
bed not great in thickness  
& folded by underlying Onondaga

Read Nat. Hist. N.Y., Part V,

Agriculture, by E. Emmons

Mention *Terebratula lepidota* at  
Manorville.



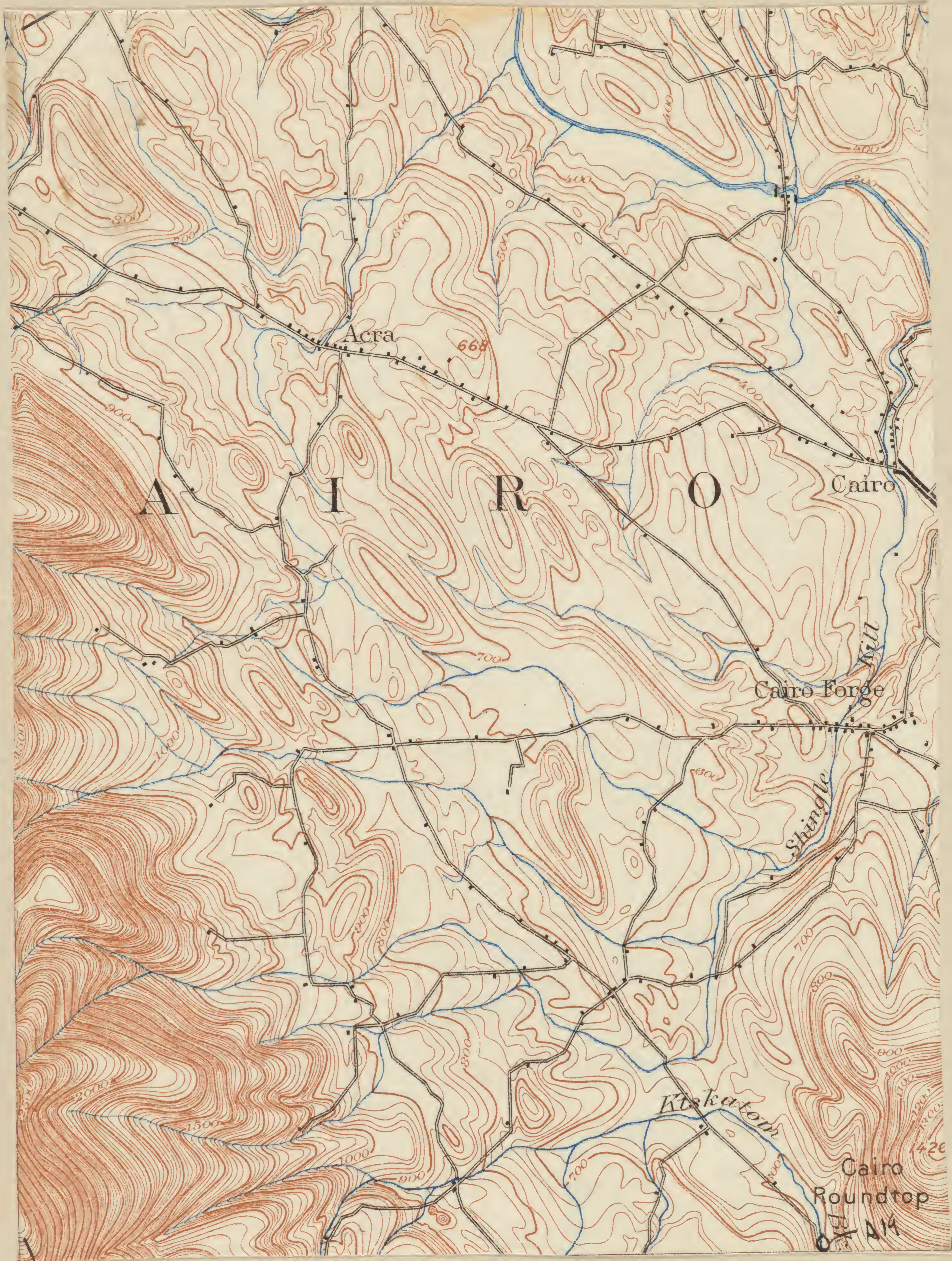


152-2

152-2



1657a





1658

August

88

A19 — Dark shales in red & green  
beds mounted by X-bedded ss.  
Ostracods in shale Just W. Cairo  
Round top

Jenny's notch

1080 — 1192 — Covered

1192 — 1195 — red irregularly bedded ss

1195 — 1775 — Covered

1775 — ~~1850~~<sup>1850</sup> — hard sandy red shale

1850 — 1895 — red beds

1895 — 1905 — hard X-bedded ss.  
turning red at top.

1905 — 1907 — red bed.

1907 — 2130 — occasional crops of red  
shale & ss.

2130 — 2135 — Red weakly X-bedded ss

2135 — 2170 — ~~ss~~ cliff X-bedded ss.

with top in road at 2220.

2220 — 2232 — covered but probably  
red ss.2232 — 2252 — X-bedded ss. with  
red shale above it.

2252 — 2295 — Covered

2295 — 2301 — X-bedded ss.

2301 — 2325 — " " with  
much conglomerate at top.

2325 — 2338 — X-bedded ss on conglomerate.

2338 — 2393 — mostly covered, 10'   
red sandy sh. at bottom

Notch 2393 — 2403 — 10' + X-bedded ss.

24' up slope to south

2403 — 2430 — X-bedded ss.



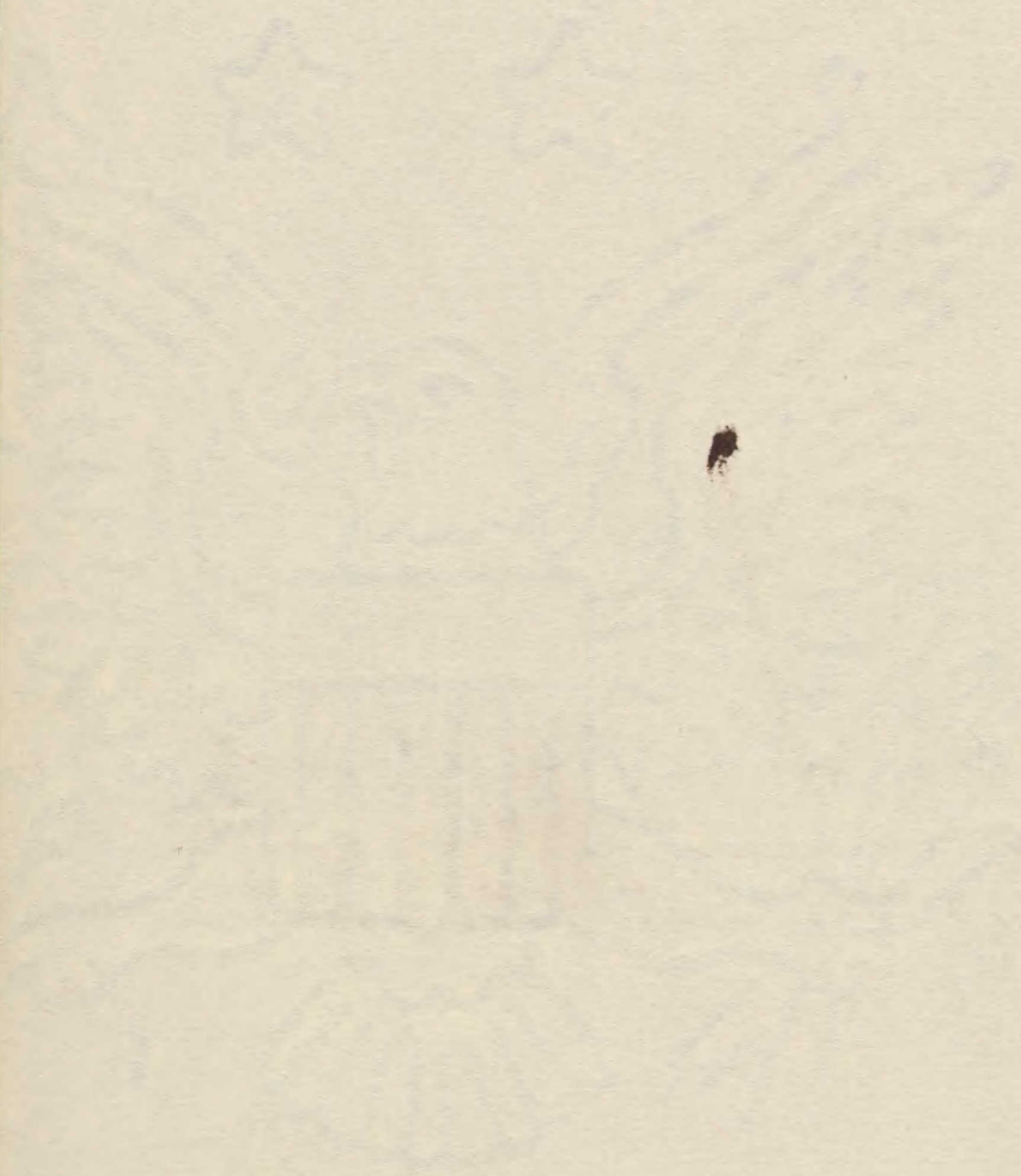
2430-2440 - X-bedded ss. ledge.  
2440-2480 - Covered  
2480-2500 - X-bedded ss.  
2500-2530 - Covered  
2530-2538 - coarse gray ss.

A19<sup>1</sup> - large quarry in X-bedded ss having *Eospermatopteris*, about 20' thick. Under the ss is 1' green shale and under that 3' ± of red shale.

A19<sup>2</sup> - Dark shales & ss. with *Protolapiclodendron* & *Eospermatopteris*

The type section of the Mount Marion is apparently the cliff just west of Mount Marion.







1860

August 20 -

Plattekill Cove

90

Ledge of conglomerate about 6'-8' thick with top passing under road at single house (X). Pebbles mostly small but up to 2 or 3" in a matrix of coarse ss. Matrix rather dark & rocks weather dark. Uppermost surface chiefly sand with a 3-4 foot bed of sand above it.

Section up Plattekill from 10 feet below County line to ~~summit~~ Devils Kitchen at 1872

1170-1200 red shaly sandstone with lighter red burrows. At top about 11' green sandy shale

1200-1215 - At base dark slaty shales with plants, followed by heavy-bedded ss. ~~A bedding on face gave strike N 75° W 75° W. May not be reliable.~~

1215-1222 Red crumbly shales passing into smooth red siltstone, then 4-5' crumbly red shale, say 1' green crumbly stone & 6" slaty dark shale. Top surface N 57° E 50° NW.

conglomerate near gradually above road & is about 20' above it at about 1/4 mile



1222-1228 - X bedded ss with a little dark slaty shale

1228-1235 - Red beds a hard sandy crumbly red layer in about middle of interval dip  $50^{\circ}$  about  $N47^{\circ}W$ . 1' green beds at top

1235-1252 Heavy bedded - X bedded greenish ss. Ledge about 25' thick in cliff

1252-1282 - Red beds with crumbly smooth and red ss beds.

1282-1302 - Heavy bedded X-bedded ss. with some pebbles at base component of dip  $50^{\circ}$  in direction of road

1302-1311 - Green crumbly shale passing into dark green siltstone

1311-1350 Mostly covered but about 5' red beds at base.

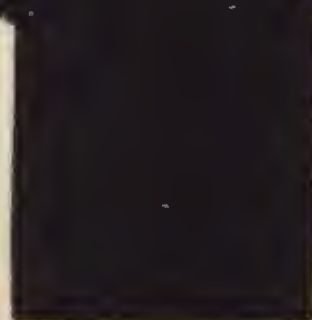
1350-1362 - X-bedded, heavy bedded greenish ss.

1362-1378 - Red beds containing dark smooth barren shales at base

1378-1381 - Ledge ss.

1381-1460 - Covered. Possibly reds.







Lighting on ledges  
across valley from big  
bend at 1620' gave  
a component of  $2\frac{1}{2}^{\circ}$ - $3^{\circ}$

1460-1530 - Great mass of greenish heavy-bedded ss with *Eospermatopteris*. Top surface in contact with red beds gave  $N50^{\circ}E$   $5\frac{1}{2}^{\circ}NW$ .

1530-1535 Mottled red + green becoming dark green + shaly at top. This bed is about 7'

1533-1548 - X-bedded ss.

1548-15~~50~~ - red shaly ss. becoming green in upper foot.

1550-1641 - Great bed of heavy-bedded X-bedded ss with plants

1641-1670 - Red beds.

1670-1681 Green beds passing into heavy reddish-greenish ss. at top for 5'.

1681-1705 - Red beds.

1705-1750 - Great mass greenish X-bedded ss.

1750-1756 - Knotty red.

1756-1825 - heavy bedded conglomeratic ss. much cong. at bottom.



1863

93

Chadwick readings from 1170' up

Above car.

First exposure 137' beds 1170  
 Covered (for 215' horiz.) 50' 1282  
 Second exposure 48' " (above 1311)  
 Covered (for 35' horiz.) 10'  
 " } ? Flaps 5' 5'  
 " (for 265' horiz.) 60' 1350  
 Third exposure 44' beds 1381  
 Covered (for 600' horiz.) 130' 1460  
 Fourth exposure 88' beds  
 to R. bend,  
 and 100' "  
 to L. bend = 188' (1620?)  
 and 93' beds  
 Covered (for 60' horiz.) 15' (betw. 1681 + 1705)  
 Fifth exposure 175' beds  
 (to sign over road) 1840  
 Covered (for 140' horiz.) 10'  
 Sixth exposure 30' beds 1860  
 Covered to road summit &  
 bridge (540' horiz.) 1872  
 Total 1000' beds in 690' vert.  
 or 310' dip in 1.1 mi. baseline.  
 = 3° average dip.



1825-1840 - red beds.

Above are heavy-bedded ss. at least 100' above road

1840-1860 - X-bedded heavy-bedded ss.

1860 - covered to Devil's Kitchen which 1860 by contours. At Devil's Kitchen is a great sequence of ss + red beds. This bridge is at 1872 by barometer. Dip appears to flatten upward  $2\frac{1}{2}^\circ$  component on upper ss above the bed.

St. about 30' above bend strikes  $N50^\circ E 30^\circ NW$ .

64.35  
64.75  
7.40

Section is 1.6 miles from bridge in Platte Clove.

Next section begins at 1.7 miles & runs to 1.8 miles from bridge section begins at. ~~1040~~ 1038

~~1055-1055~~ green ss. for 20' below ~~1055~~

1038-1040 - heavy bedded ss

1040-1055 - red beds ending in 2' green ss.

1055-1073 green coarse X-bedded ss.



980  
760



1572  
1090  
882

1065

- 1073-1078- red beds 95  
1078-1092- X-bedded greenish ss  
1092-1105- Red beds with  
a lens 3' thick of X bedded ss  
in middle  
1105-1120- X-bedded ss. greenish  
1120-1170- ~~just below the line~~  
~~not beds~~ Red beds from  
here to 1170.

Strike + dip on upper surface  
~~N50°E 5 1/2° NW 3° NW~~ N50°E 5 9/16° W

### The Chasm (Kaaterskill Creek)

In lower part of Chasm about 15'  
X-bedded ss.

Red beds about	75'
X-bedded ss	25
Red beds	?

A hard red bed about 15'  
above lower ss dips 4° S 85° W.

A 20'- Hard bed for 0.3 miles  
crosses road at end of 0.3.

A 20- Strike nearly east-west  
and dip 1/2 to south at bottom of  
glen. Mr. C. thinks this portion  
on axis of anticline. Top ledge  
dips about 50° N 65° W. Falls  
is over a hard ledge of



ss like that on Hy 23A. 96  
 Rock mostly hard argillaceous  
 + sandy, but zones in it are  
 weaker or stronger thus  
 etching out under falls etc.

~~Bed 9~~ + 95' exposed under  
 bridge. Above bridge is softer  
 Mount Marion arenaceous shale

A-203 hard band just above bend  
 in face of hill Banks of sandy  
 shale with thin ss. layers

A 20<sup>2</sup> — small patch sandy shale  
 with thin ss. beds N25E 8°SW  
 heavier ss. underlie the upper  
 shaly beds. Possibly 20' exposed  
 Mr. Chadwick found fossils here.

A 20<sup>k</sup> — Quarries in flagstone



E *Handwritten signature* W

5



1667

August 21

97

A21 - Esopus for 0.15 miles west of R.R. track.

A21' - Anticline bringing up <sup>Esopus</sup> Schenectady in center with Onondaga on flanks.

A21<sup>2</sup> - boulder of Stony Hollow bedded probably not far out of place

A21<sup>3</sup> - cut at base of hill showing 20' or more of sandy shales of lower Mt. Marion.

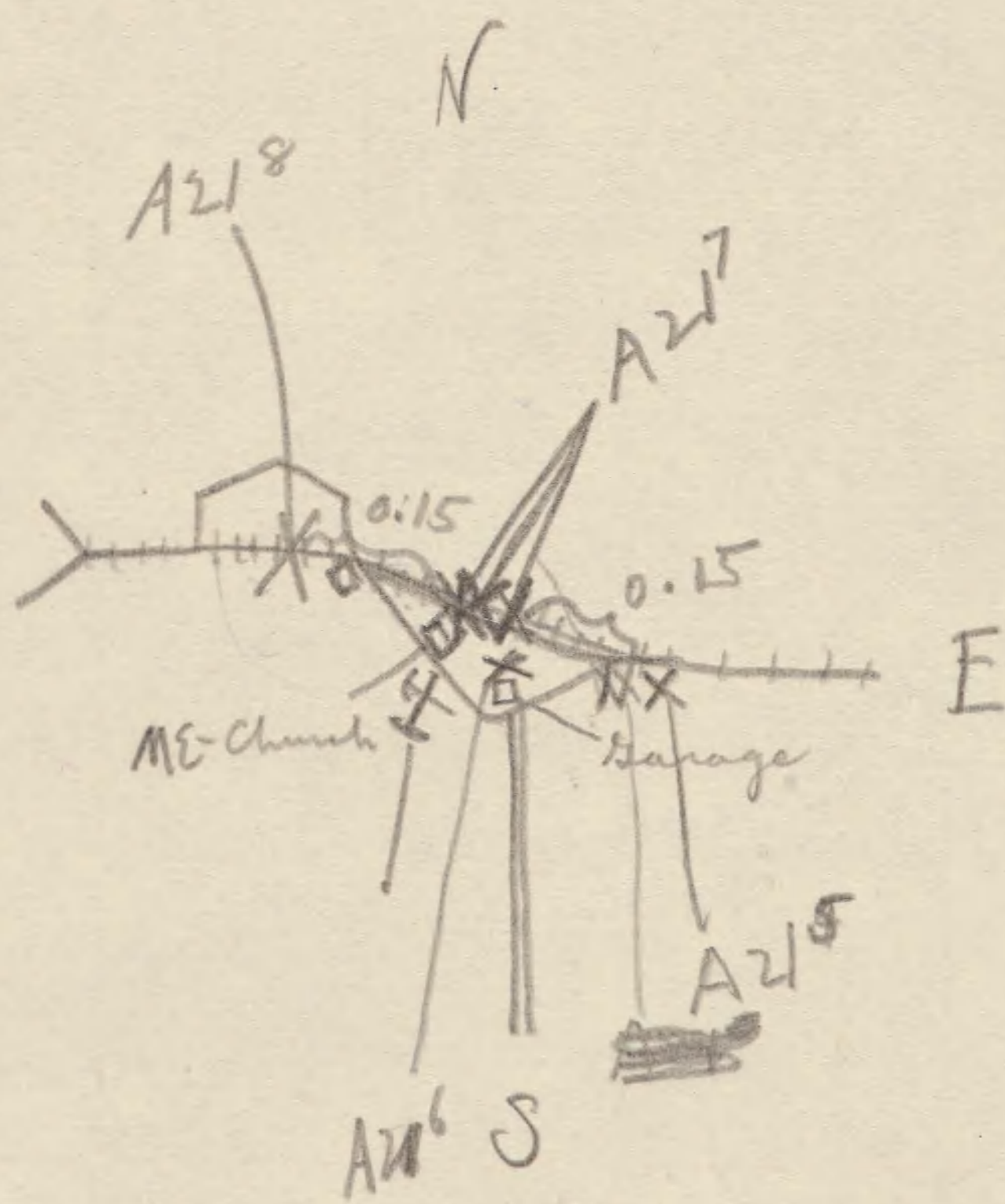
A21<sup>4</sup> - cut 35 paces long in mudstone & beds of ss 6" thick. Contains Paracyllas, Grammysia and Camarotoechia. Strike N7°E 8°NW

A21<sup>5</sup> - Cut about 20' thick in ~~shale~~ sandy mudstone. One storm-roller bed. Another cut occurs about 50 yds up old road from A21<sup>5</sup>. About 15' of rock contains storm-roller bed at top with S. circularis. Intersection near old roads.

A21<sup>6</sup> - behind garage at intersection comes fossiliferous Hamilton. To SW of bend comes a small quarry in flagstone containing Protoplepidodendron

A21<sup>6a</sup>

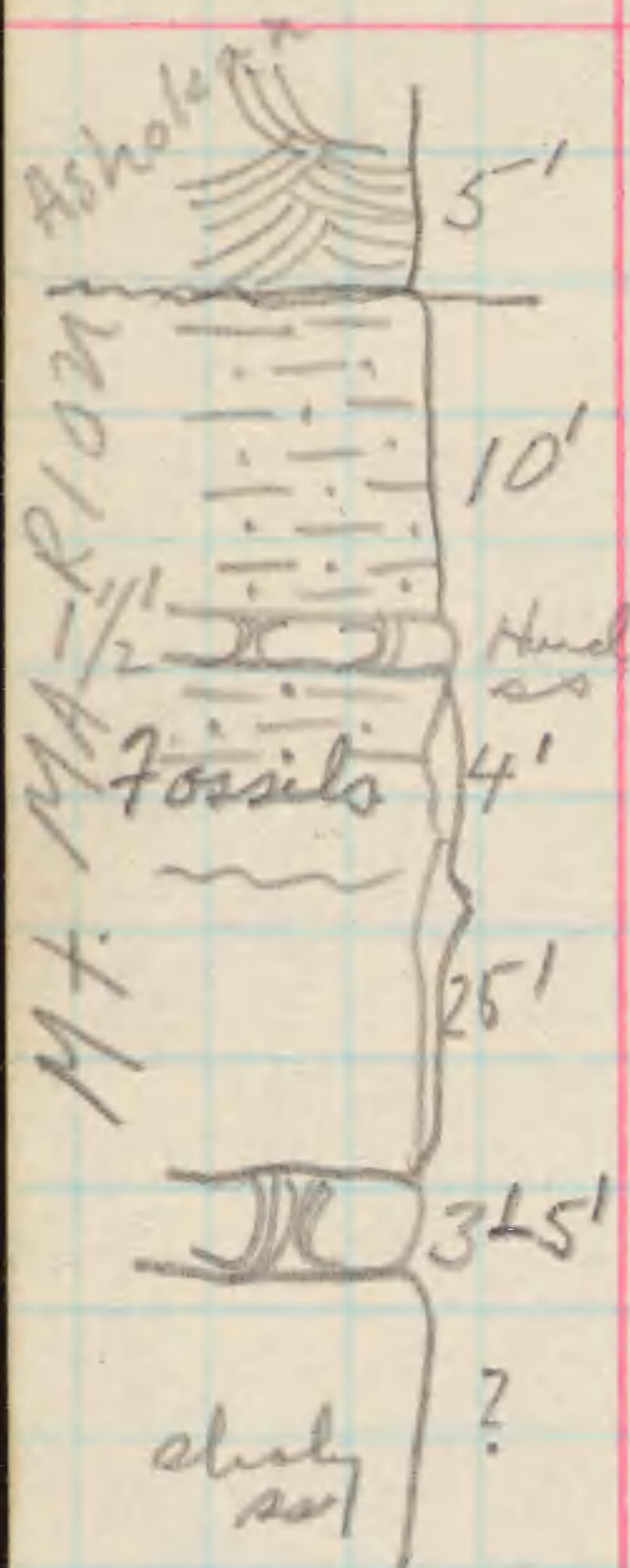






1C68

A21<sup>7</sup> cut about 100 paces long 98 under ME Church exposures about 15-20' of rock. In the softer beds under the hard <sup>stratified</sup> layer *Camarotoechia* & *Menulites* were found. This bed and the associated ss probably are the same as those at the garage. The flags thus come in above the sandy shaly beds which are undoubtedly Marine. The fossils come in 0.15 mile from intersection of new & old roads.



A21<sup>8</sup> - 0.15 miles farther west on road comes thick cut in Ashokan beds cut 0.07 mile long and about 20-25' high

A21<sup>9</sup> - dark sand crumbly shales overlaid by X-bedded ss. Greenish blue on weathered edges of shaly stone

A21<sup>10</sup> - X-bedded ss by house and a little beyond. ledges of ss appear in lozenge-shaped hills.

A21<sup>11</sup> - Low hill with X-bedded ss of Ashokan type showing on west side house and at 3 corners just beyond the house and opposite road from north is a large cut. 0.1 mile from



here appear first red beds at  
A21<sup>12</sup>.

1669 99

A21<sup>12</sup> Section begins on slope of hill at bend. To west at ~~foot~~ base of section are some 20-30' mottled red + green beds + reds, overlaid by 2' heavy ss, followed by 2' crumbly green beds; 4' coarse heavy bedded ss; 1 1/2' crumbly green + capped by 10' x bedded ss. Dip 4° N45W

A21<sup>13</sup> - x bedded ss. about 15' high. Ss form long low, discontinuous ridges.

A21<sup>14</sup> - For 0.25 miles up glen a succession of red, green + dark shales. Then comes about 35-40' heavy bedded ss. forming falls + cascades. On a red bed half-way between bridge + ss. I measured a dip of 4° in ~~ss~~ upstream. Heavy ss comes in on 200' distance.

One mile N. of W. Langerties along road at foot of Mtn. the foothills between road and Mtn. consist of successive ledges of ss interbedded with red shale to the Mtn. front.

Some of the ledges on Mtn. front seem to lens out laterally.



A 21<sup>15</sup> - large in red beds with 100  
X-bedded ss above. Strike on  
flat red bed gave  $N17^{\circ}E 6\frac{1}{2}^{\circ}NW$ .

A 21<sup>16</sup> cut in road at lower bend  
showing red beds & green ss &  
X-bedded ss.

A 21<sup>17</sup> - Soft crumbly sandy sh. with  
thin ss layers.

A 21<sup>18</sup> - in bed of stream under dam is  
a storm-roller zone, above this  
are about 15' shaly weathering  
argillaceous ss with fossils:

*Camerofoecia*, sp. *uncornatus*,  
*C. coronatus*, *P. flabellum*, sp. and *asub*  
type. At top of bed is another  
storm-roller. This section is near  
top of Mt. Maicon.



A4'

101

## ED STATES

1671

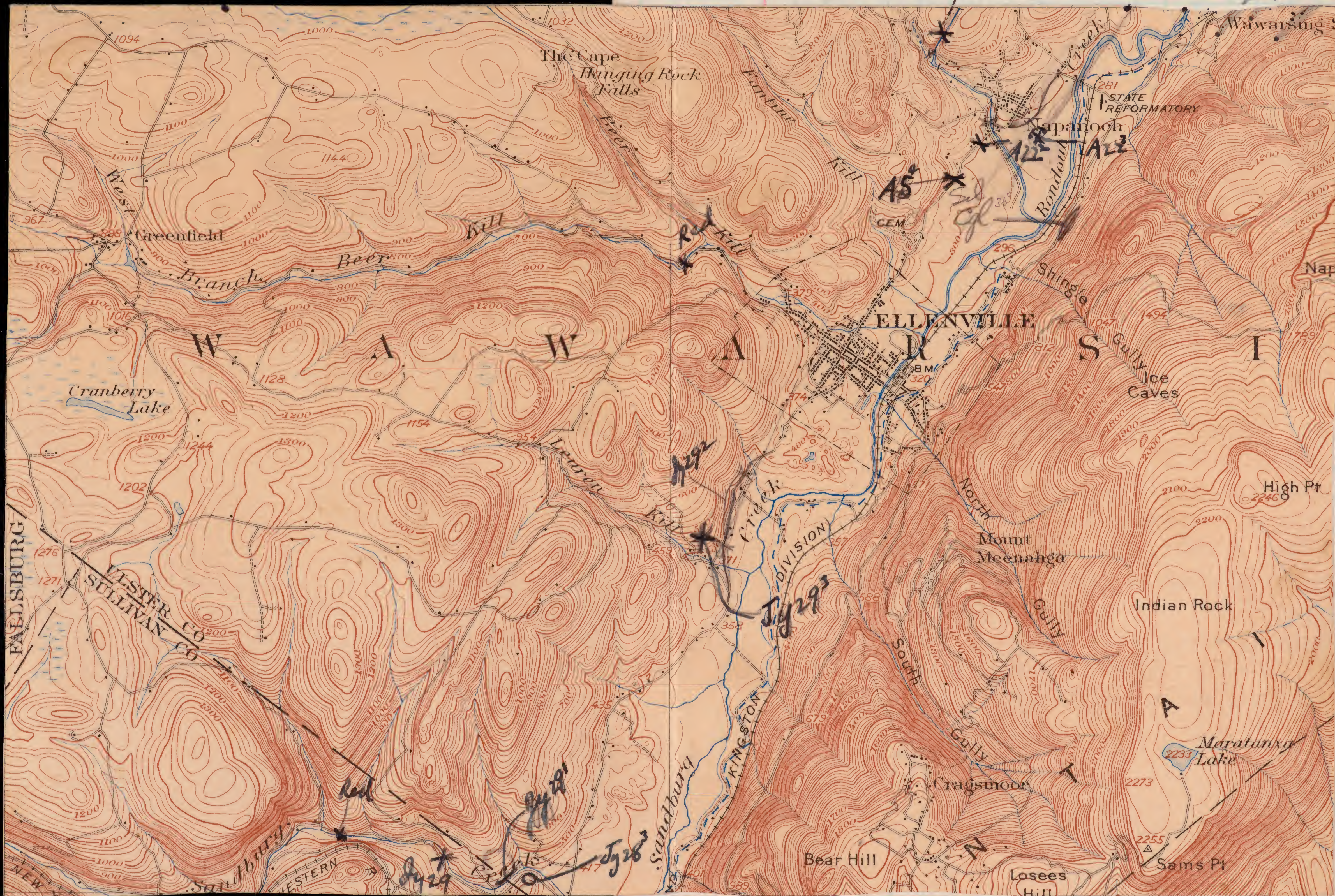
gradually away and forms an inclined table-land that is  
versed by a few shallow gullies. On the map each of the  
features is represented, directly beneath its position in  
sketch, by contour lines.

The contour interval, or the vertical distance in feet between  
one contour and the next, is stated at the bottom of each map.  
This interval differs according to the topography of the area  
mapped; in a flat country it may be as small as 1 foot; in a  
mountainous region it may be as great as 250 feet. Certain  
contour lines, every fourth or fifth one, are made heavier than  
the others and are accompanied by figures showing altitudes.  
The heights of many points—such as road corners, summits,  
surfaces of lakes, and bench marks—are also given on the map  
in figures, which show altitudes to the nearest foot only. More  
exact altitudes—those of bench marks—as well as the geodetic  
coordinates of triangulation stations, are published in bulletins  
that are issued free by the Geological Survey.

The lettering and works of man are shown in black. Boundaries,  
such as those of a State, county, city, land grant, township,  
or reservation, are shown by continuous or broken lines  
of different kinds and weights. Metalled roads are shown  
by double lines, one of which is accentuated. Other public  
roads are shown by fine double lines, private and poor roads  
by dashed double lines, trails by dashed single lines.

Each quadrangle is designated by the name of the principal  
city, town, or natural feature within it, and on the margin







1. Pt. Peter & vicinity
2. ~~Sparrowbush & vicinity~~
3. ~~Reservoir no. I.~~
4. ~~Hugenot~~
5. ~~Matamoros~~
6. ~~Rose Point.~~
- 6 1/2. ~~Pine Kill, Culbertown, Haven. ?~~
7. ~~Wurtsboro.~~
8. ~~Sandburg Creek Valley~~
9. ~~Beer Hill~~

To August 5.

$$\begin{array}{r} 2300 \\ 200 \\ \hline 2500 - 3300 \end{array}$$

$$\begin{array}{r} 3250 \\ 100 \\ \hline 3150 \end{array}$$

$$\begin{array}{r} 1350' \\ 1600 \\ \hline 2950 \end{array}$$

$$\begin{array}{r} 535 \\ 2 \\ \hline 1070 \\ 218 \\ \hline 1338 \end{array}$$



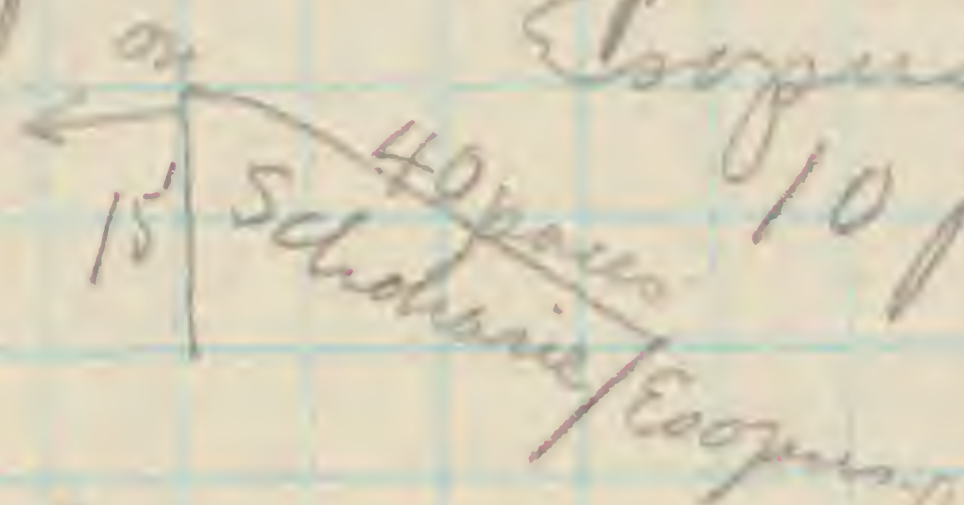
August 22

1872

A22 Wawarsing - Quarry in Onondaga  
about 0.3 miles N of main road and  
about 1 mile east of Wawarsing  
Outcrop belt 100 paces in width  
Strike  $N 27^{\circ} E$   $38^{\circ} NW$ . Magnetic  
N here is  $N 40^{\circ} E$   $38^{\circ} NW$ .

Strike on uppermost exposed beds is  
 $N 20-25^{\circ} E$ . Onondaga outcrop  
covers ~~the~~ 100 paces in width  
~~at~~ north of road end. Onondaga  
Scholarie outcrop is exactly  
at road end and runs about 20  
paces down dip and strikes  $N 41^{\circ} E$ .  
The Scholarie here consists of  
alternating shaly + limy bands.  
Onondaga begins at about 330'  
by contour.

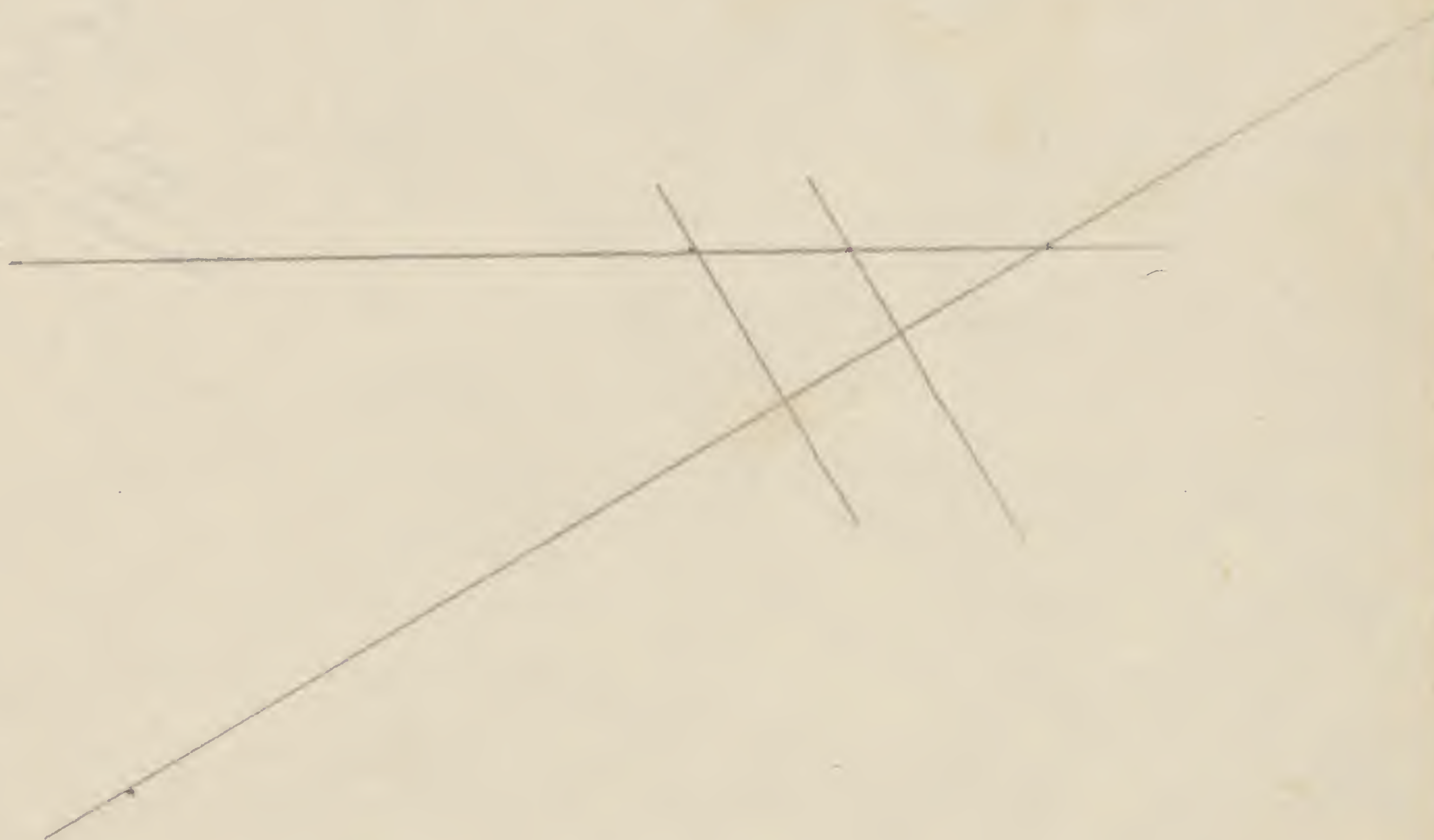
Fossils collected 40 paces  
from top according to diagram  
on map. Eoopus continues for about  
10 paces from Scholarie



Onondaga - Scholarie contact 200  
paces from stream + road inter-  
section.

Declination  $12^{\circ} E$







1673

270° — A22<sup>1</sup> — Hornbeck Lime Co. Qy —  
 S wall Qy 10' high, N wall 10',  
 35 paces between walls. Strike  
 N30E° 30-34° NW. Lower Onondaga  
 knobbly, middle portion rather  
 pure limestone. Locality A5' is  
 0.15 mile from intersection. This  
 outcrop is Esopus and lies just  
 under the quarry. The contact is  
 feet north of the highway  
 at ~~point~~ the quarry.

The approximate base of the  
 Onondaga is ~~about~~ at the  
 roadside 0.6 miles from the  
 intersection.

A22<sup>2</sup> — Dark gray sandy crumbly  
 mudstone exposed horizontally for  
 60' down dip. Strike N33° E

55 A22<sup>3</sup> — Hornbeck (L.A.) limestone —  
 Pit in Onondaga, Strike Ca. N35E  
 42° NW. Mentioned by N.A. Darton.  
 This locality is 0.25 mi. east of bridge  
 at Naparoch + 0.1 mi. S of road in  
 cornfield

A22<sup>4</sup> — Rock in quarry of Ashokan  
 Type — Strike about N30E 20° NW



1074 104

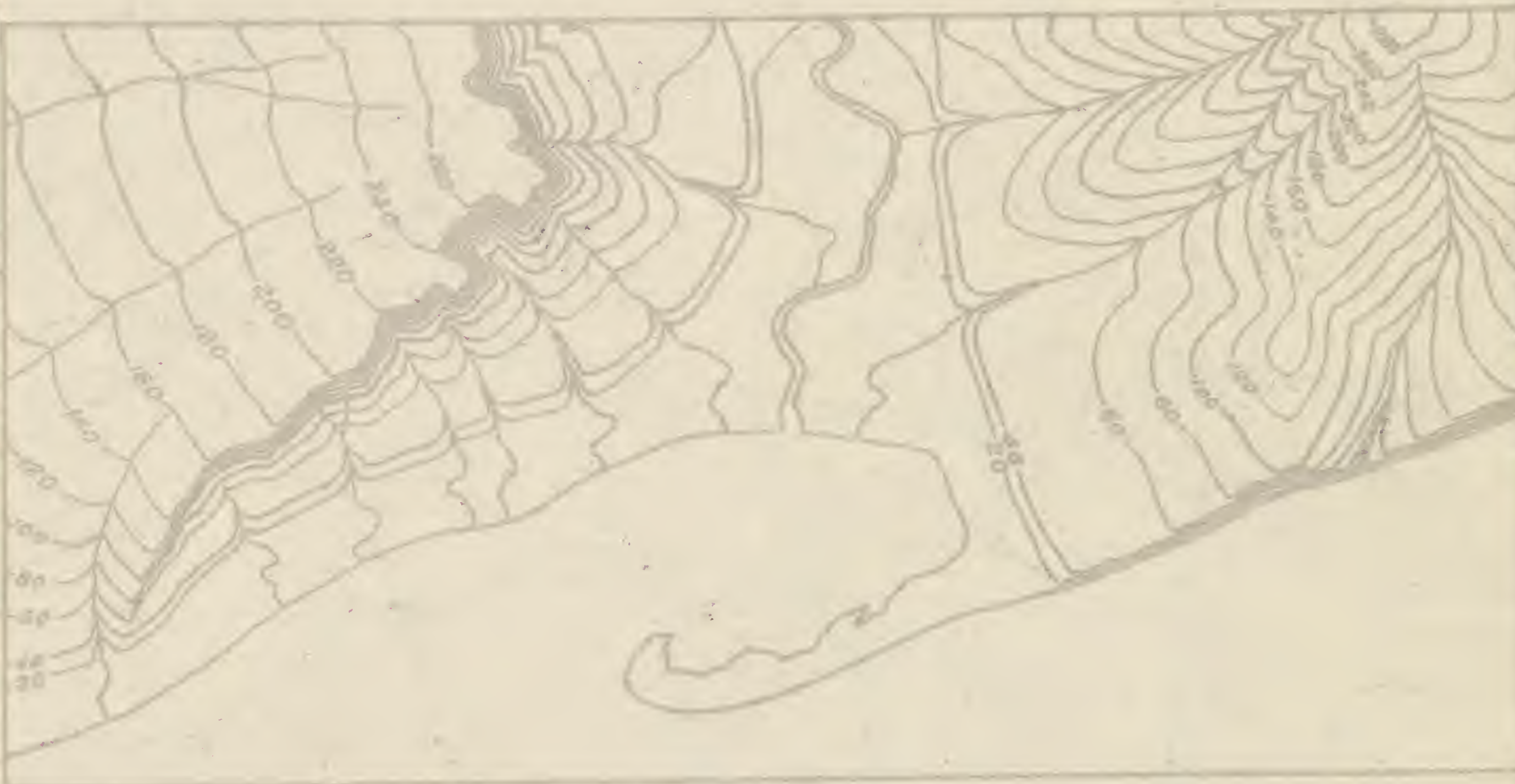
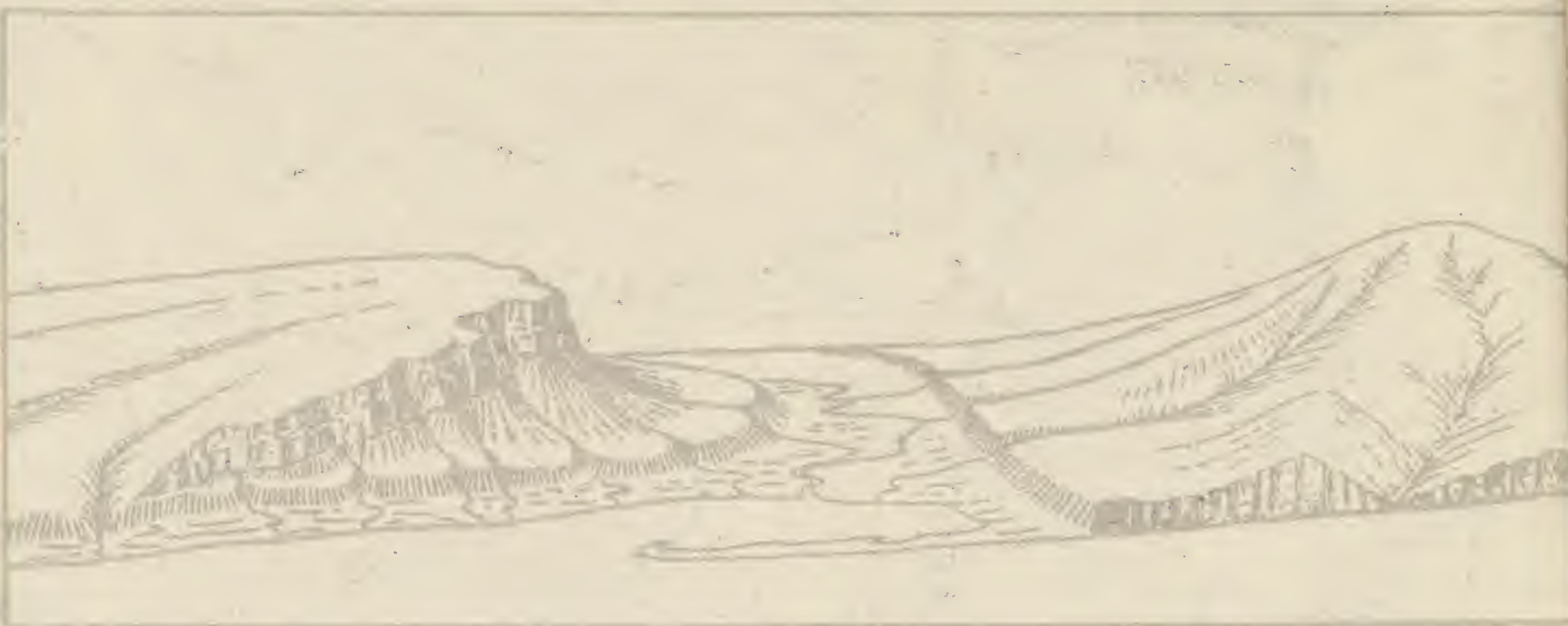
A22<sup>5</sup> - X bedded ss. of Ashokan type striking N 30 E and dipping strongly upstream

~~Fossils~~ Fossils are not common in lowest beds exposed in Vermooy Creek, large sp. granular occurs with pebbles & thin bands of quartz pebbles can be seen. Upstream from this ~~layer~~ locality and in hill we saw nothing but beds of Ashokan type. This is probably the highest Hamilton. The fossiliferous beds measure about 60' down dip horizontally

Outcrop of hard bed on top of hill 0.6 mile SW of High Falls road on U.S. 209. Must be Esopus



1674a



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly inclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently slopes





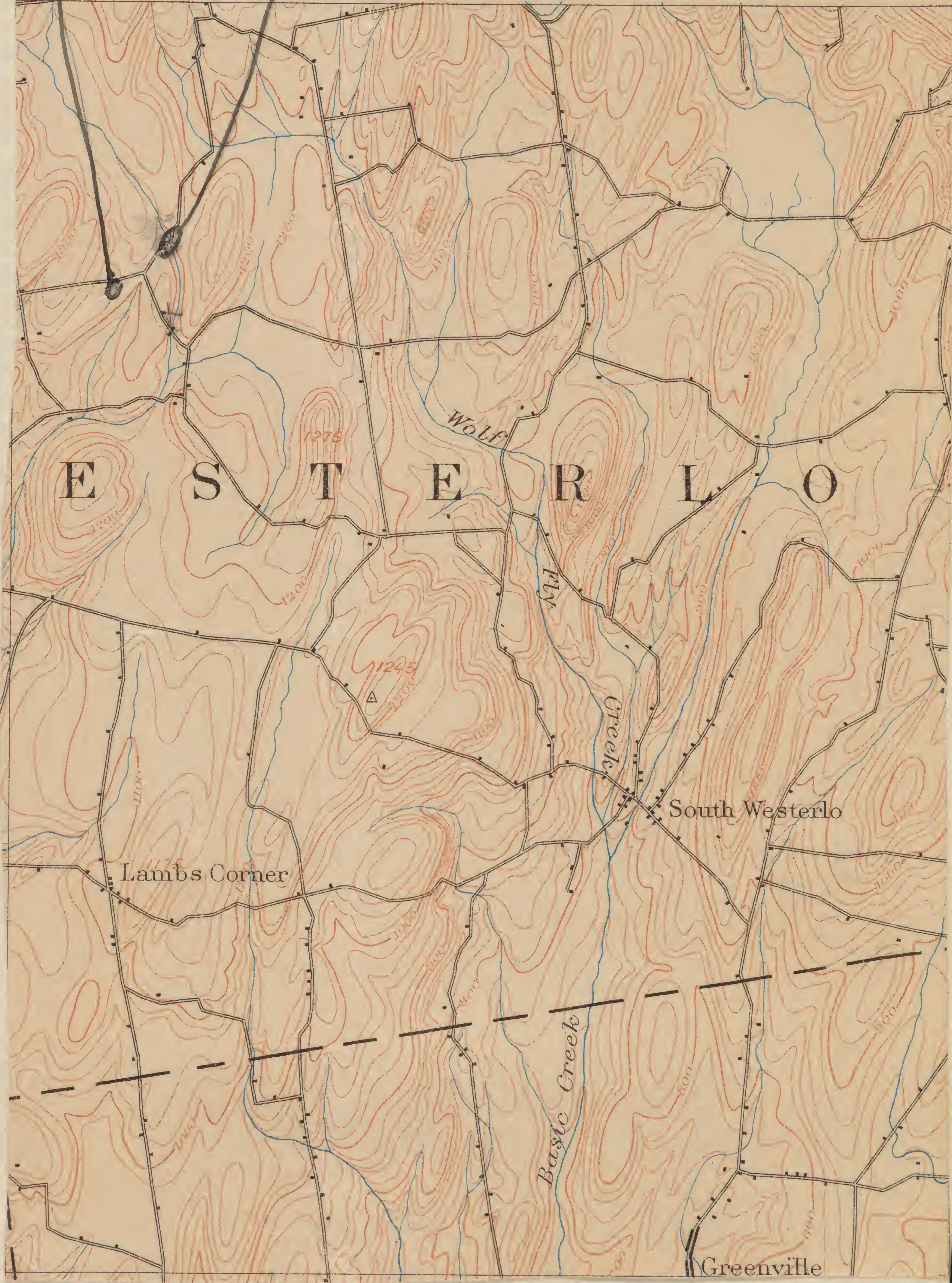


Have fossils  
Lamell.

a Sherburne

16746

NEW YORK  
DURHAM SHEET





August 23

1875 105

August 23 - Glen just N of Hervey Street. Lower part glen composed chiefly of heavy-bedded hard ss, some cross-bedded some in very heavy beds forming. At a heavy ledge forming the side of a falls is a calcareous layer with many ostracods. Red beds appear in the falls above this one and continue upstream and beyond the bridge for about 30' vertically. This stream cuts thru a low anticline, the beds in the upper part of the glen dipping gently upstream and the lower part of the glen floored by rocks dipping northwest.

A23' - Large falls about 100 feet down stream from bridge. Falls over 12' hard x-bedded bluish ss. overlying a few feet of red shale. Under bridge is a flat calcareous bed overlying, and overlaid by 9-10" shaly rock. Both limy bed & shaly rock above abundant in ostracods. This is the same ostracod bed as upstream, but dipping gently upstream.



A23<sup>2</sup> - About 1 mile SSW of 106  
Durham, ledges of congl. ss  
in field. Top of lowest ledge  
with fossils.

1676

A23<sup>3</sup> - Ledge of x-bedded gray ss  
with fossils

Greased + oil changed 9493

August 24

From West Hurley Southeast  
from RR bridge down to east  
end of road leading into Stony  
Hollow excellent exposures of  
Ashokan. Just above turn  
comes a heavy layer of olive  
crumbly beds possibly the same  
as the heavy bed exposed below  
the long section on the R.R.

A24 - Old quarry 12' high + ledges  
above. Lower 1/2 in shaly crumbly  
ss. with storm-roller at top. Above  
storm-roller 5-6' shaly rock then  
6' ledge heavy bedded ss. Fossils  
rare.



6 385  
10785  
682  
785  
780  
6280  
4710  
53.4 585  
↓



A24<sup>1</sup> - 3' crumbly shaly ss, 2 1/2' dark gray fine grained ss. with 107 nuculites, 1' Pebble bed in 2 layers separated by 2" ss. 1077

A24<sup>2</sup> - At bend of road before Bridge over R.R. fine grained constricted ss. with very large Tropidoleptus

A24<sup>3</sup> large cut in bank on N-side road. Rock composed of 15-25' dark shaly, crumbly ss. with 8-10' storm-roller bed at top. Fossils rare. Dip 2° N 40° W.

Same rocks exposed in R.R. cut nearby. Cut extends about 0.1 mile around bend

Hard bed SE of Stony Hollow  
At N end RR cut rock we regarded as belonging to the hard bed consists of softer + harder layers of shaly, dark ss with Leiorhynchus. This part of cut is fully 150 paces from road intersection and about 20' high 100 paces from road intersection. This portion probably should be excluded. Here the dip is decidedly NE, strike N 70° W 4 1/2° NE

$$\begin{array}{r} 300 \\ 375 \\ \hline 375 \end{array}$$

$$\begin{array}{r} 100 \\ 5280 \\ \hline 10560 \\ 375 \\ \hline 681 \end{array}$$



1078

108

200 paces south from road intersection comes hard layers with crumbly material above. The upper 2' of this layer contain Cratogeomys & worm tubes. In the next 10' below come many small fossils.

200 paces farther down track from upper fossil bed appears rock with large Schizophoria and A. spinosa, same fauna as we found near Mt. Marion. At this point the upper bed is about 35' above the tracks.

A 11<sup>21</sup> revisited. Strike  $\overline{063^\circ W 40^\circ NW}$  taken on thin hard bed with small Pentamerella. No South dip as Mr. Chadwick suggested. No cleavage here & rocks show strong bedding clearly.

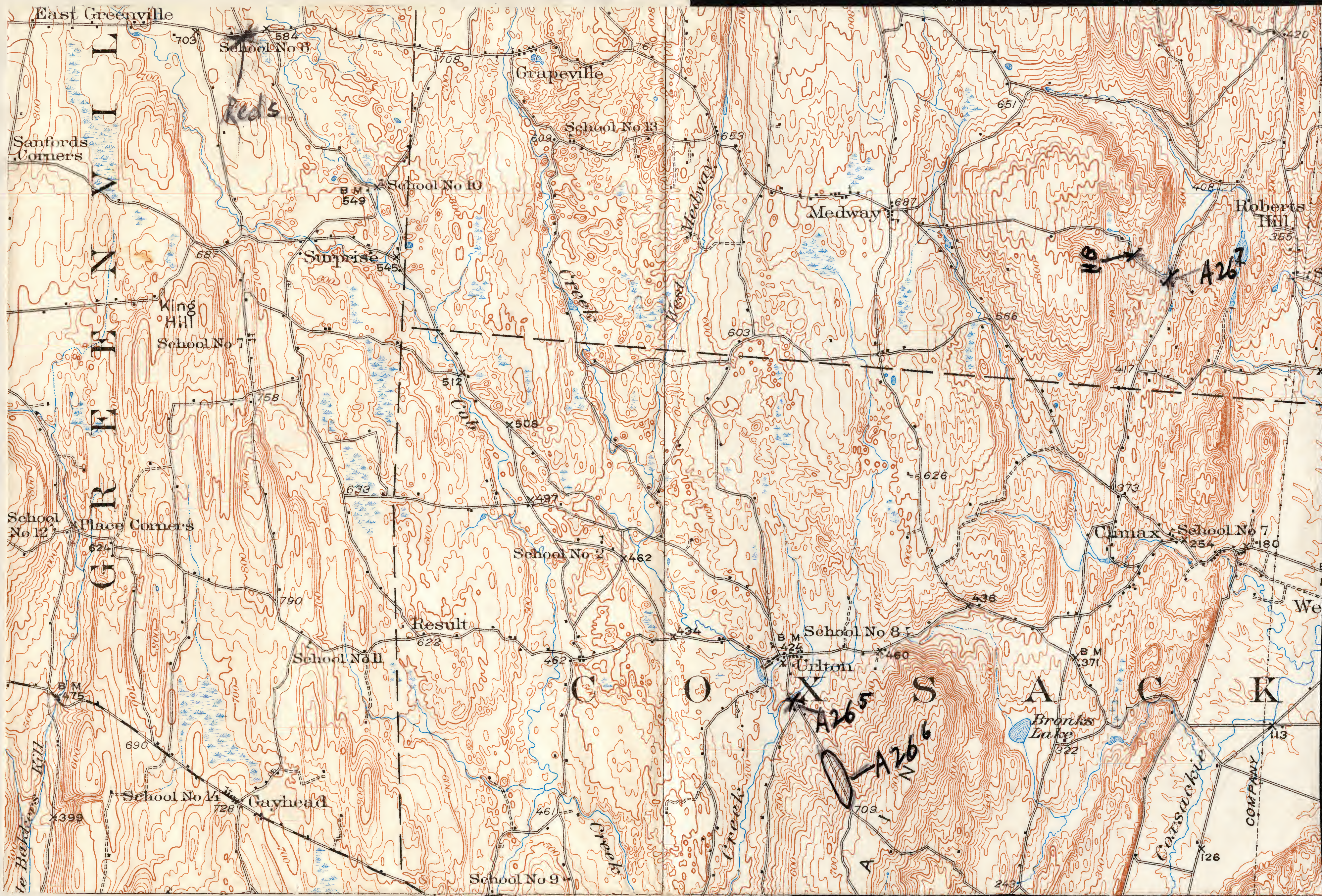




The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly closed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping



16786





works of man), such as towns, cities, roads, railroads, and boundaries. The symbols used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, lakes, and the sea by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff. The manner in which contour lines express altitude, form, and grade is shown in the figure below.



This is a topographic map of the Albany, New York area, showing the Adirondack Park, Schoharie River, and surrounding towns. The map includes contour lines, roads, and various landmarks. Handwritten annotations include 'A274', 'A254', 'A253', 'A252', 'A251', 'A255', 'A256', 'A257', 'A268', 'A269', and 'A25'. The map also shows the boundary between Albany County and Greene County.



Aug 25.

1679

109

A25- About 15' of shaly crumbly ss. passing upward into thin-bedded platy ss. Contains Tentaculites & Microspirifer. This is highest fossil bed of Mt. Marion here. Belt of Ashokan about 1 mile wide making 100' of Ashokan. Between A25 + Reds come flags + interbedded crumbly olives

A25<sup>1</sup> - Heavy-bedded ss + calcareous ss with many fossils. Suggests Colgate ss. Cicoronites a, A. erectum, Myosia subalata

A25<sup>2</sup> - 20-30' ledge of shaly ss with thin layers of heavy-bedded ss. Miss G. reports a few fossils

A25<sup>3</sup> - Occurs in thin sandy shale + thin sandy flags with Cicoronites, Tentaculites + Camarot

A25<sup>4</sup> - Big cliffs of thin ss and arenaceous shale. Also well exposed up hill east of Alcove

A25<sup>5</sup> - 20-25' cut in crumbly dark arenaceous shale with Pflabellum Paracyclas, Camarotoechia. A 15' band about 5' below summit abounds in Microspirifer &



*C. coronatus*.

1680/10

Above the Sp. bed the shales are greenish & contain large *Canarotoechia*, *P. flabellum*, *Paracyclas*, *O. undulata*. At the very top is a layer 2" thick, mainly of calcareous ss. with *Schizophoria*, *Spirifer*.

A25<sup>6</sup> - About 20' crumbly shales with *Canarotoechia* in lower 3'; ostracoda in the next 2' and becoming crumbly above and more sandy. Upper 5' heavy, irregularly bedded ss. These are Miss G's uppermost fossils.

A25<sup>7</sup> - Duplicates A25<sup>5</sup> - 20' crumbly shale, dark & greenish alternating with thin ss. ledges at top and about 5' below road intersection comes 15" bed of Sp. mucronatus. In cemetery much shale thrown out & pieces were seen with *Schizophoria* which must lie near surface at cemetery. x-bedded flags about 10' above cemetery.

A25<sup>8</sup> - About 5' below 760. at intersection in dark sandy mudstone *Spiriferoids*, *Paracyclas*, *C. coronatus*,

Ledges all along road from A25<sup>7</sup> to A25<sup>6</sup>.





Harves



Breakwater  
and jetties



Bridge



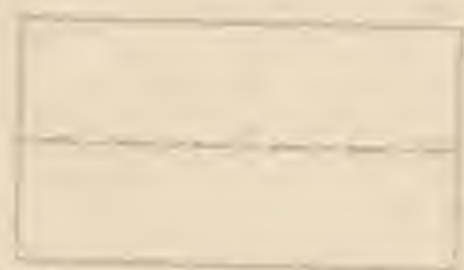
Drawbridges



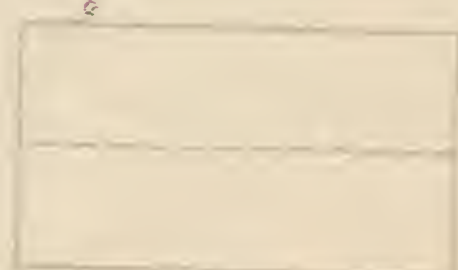
Ferry  
(point upstream)



ant



City, village, or  
borough line



Small park or  
cemetery line



Triangulation  
point or transit  
traverse station



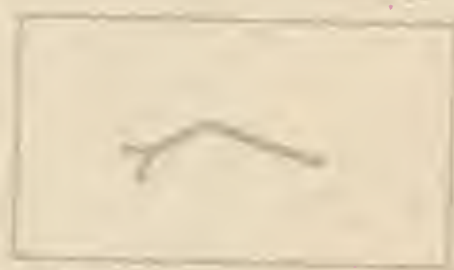
U.S. mineral  
monument



t



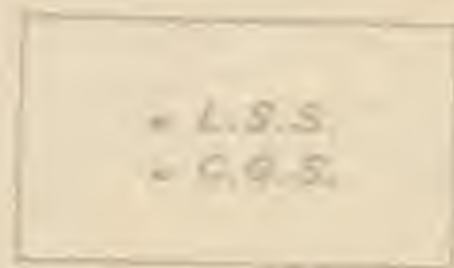
Mine tunnel



Mine tunnel  
(showing direction)

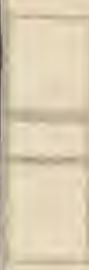


Lighthouse  
or beacon

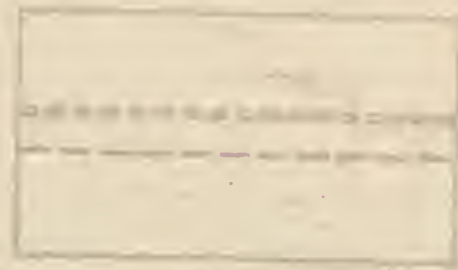


Coast Guard  
station

WATER  
(tinted in blue)



or



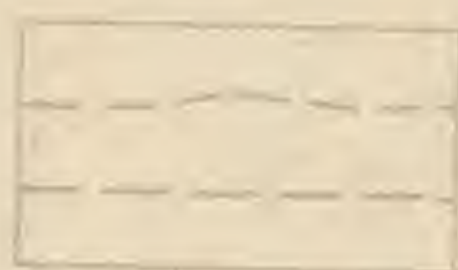
Aqueducts or  
waterpipes



Aqueduct  
tunnels



Lake or  
pond



Unsurveyed  
stream and  
abandoned canal



Spring Well



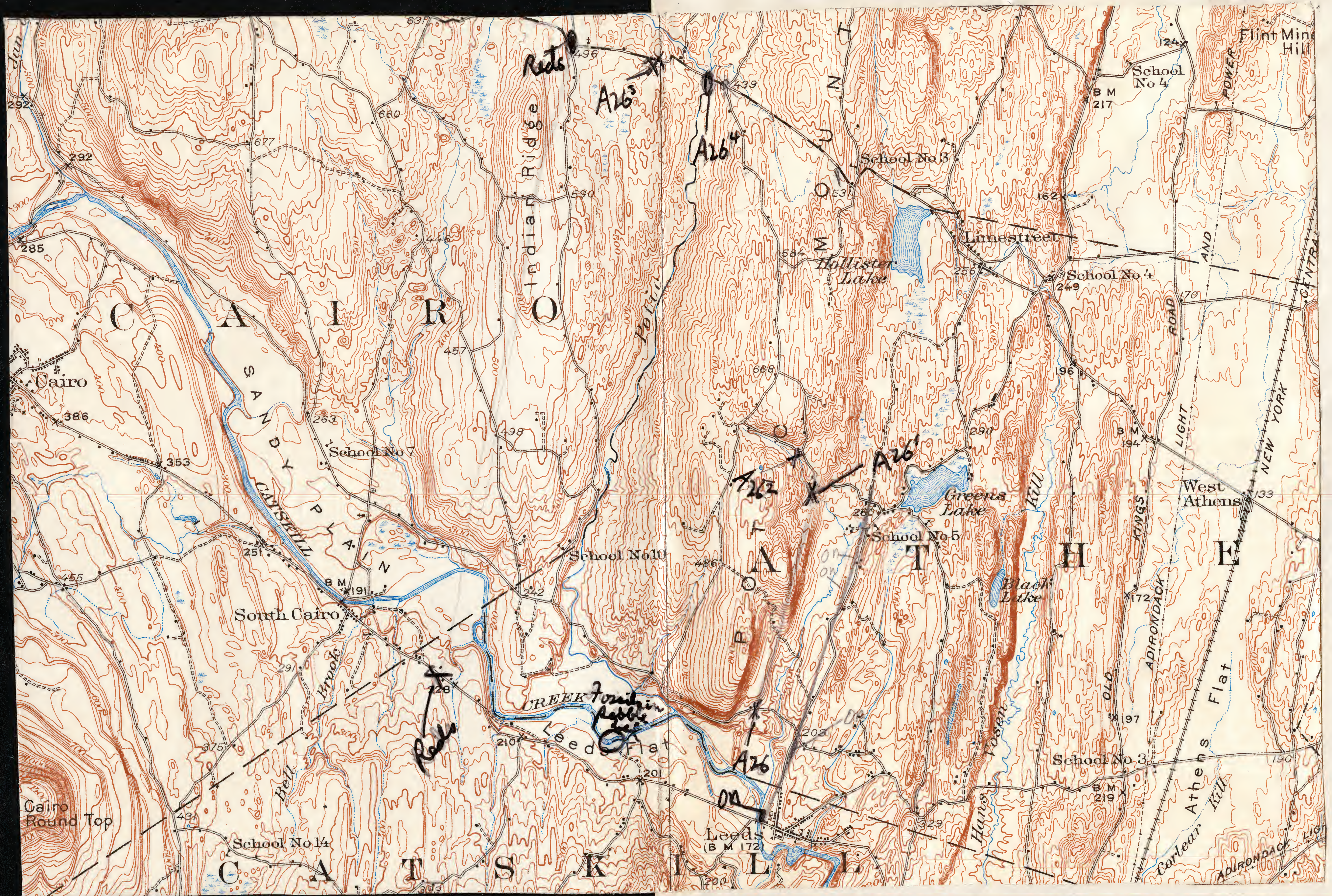
Marsh



Submerged  
marsh



1678c



400'

79°



Aug 26

1681  
///

A-26 - Probable top of Stony Hollow  
hard bed exposed in road & barn-  
yard. Exposed down road (East) for  
about 1/2 mile. Strike  $N15^{\circ}E$   $7^{\circ}NW$ .

3  
A26' - Top of hard band in stream  
forming a low falls. Soft Bakoven  
shales shown in a cut about 0.3  
mile in flat to east. Below the  
first cascade is a falls about  
20' high over a heavy 10 foot  
cleaved bed. Here the dip on  
heavy bed is  $8^{\circ}N68^{\circ}W$ . Cratopora  
was seen in upper bed. Upper  
35  
layer at 1st or 2nd cascade is a  
sandy calcareous bed. At the  
locality on Hy 23A I saw a hard  
bed with small Leiorhynchus which  
may be same as uppermost  
layer here. If true, the layers  
with Leiorhynchus probably out-  
side of Kingston probably should  
be placed in the hard layer.

20  
Bad falls about 20' above  
4th cascade. Rock of 2nd falls  
becomes softer downward  
but a hard layer with  
Spirifer forms the 3rd  
cascade. This becomes softer  
to the ledge of the 4th cascade.  
The 4th cascade is 35' ~~high~~  
high and the rock is softer



1682/12

a dark gray heavy bedded sandy, possibly calcareous rock that weathers light gray. The base of this cascade is 80' below the top of the first cascade. The top of first falls gives at least 93' of rock. The dip in the lower part of the fourth cascade is  $15^\circ$ . About 65 paces downstream from base of cascade in bed of stream appear the solid hard type of rock. At the 65<sup>th</sup> pace the rock is soft sooty shale greatly contorted. This just below this contorted bed is a harder layer with *Styliolina*. This is the beginning of the "Bakoven".

Sharp bend of road is opposite interval of 2nd + 3rd cascades or second falls.

Above hard bed are 15' soft crumbly shales.

The interval embraced by these falls covers only 150 paces down hill below upper bend in road.

The hard bed comes in again at a point 0.1 mile below house

A 26<sup>th</sup> - 2' hard sandy ledge forming falls, dips  $6^\circ$  N  $70^\circ$  W. Exposed in stream just south of house



$$\begin{array}{r} 415 \\ - 228 \\ \hline 287 \end{array}$$

Distances down from top  
 of 1st cascade

$$\begin{array}{r} 338 \\ - 256 \\ \hline 82 \end{array}$$

7	{	Top first cascade	327AT	337'	} 82'
	{	Top second cascade		330	
28	{	Top 3rd cascade		302	
10	{	Top 4th cascade		292	
37	{	Bottom 4th	"	255	

$$\begin{array}{r} 49 \\ 21 \\ 10 \\ 23 \\ \hline 93 \end{array}$$

82

$$\begin{array}{r} 67 \\ 21 \\ \hline 46 \end{array}$$

23'

3 1st falls  
 354 Interval of mid falls  
 29 Interval of 3rd falls  
 35 face of 4th falls



450  
62  
512

431  
2  
862  
16  
2781  
10

490  
428  
62



A26<sup>3</sup> - Flagstone quarries 1683<sup>113</sup> arise  
ss. Fossils common. Sp. granulosus  
Camarotoechia, N. subulata, This  
is an instance of fossils within  
the Ashokan division.

A26<sup>4</sup> - Olives of Miss. G.

A26<sup>5</sup> - Shaly with thin ss. containing  
P. lirata, & C. coronatus in abundance  
Camarotoechia, Cypricardella of gregaria type

A26<sup>6</sup> - Up hill to SE of Ulton come  
flags with fossils suggesting locality  
at A25!

SSW of  
Roberts Hill

A26<sup>7</sup> - Onondaga striking N17°E ~~B~~°NW  
Stream cut down between Onondaga  
& Bakoven which is exposed in the  
stream about 5' above the Onondaga  
Upstream for 431 paces or 62'  
vertically, a nearly complete  
section of alternating black and  
dark gray shales abounding in  
small fossils. At 431 paces (62') comes  
a hard calcareous layer 4" thick  
Bakoven of Union Springs or Cherry Valley  
type. Above this hard bed are  
about 12' soft shales contorted &  
cleaved in upper 3'.

12' sh  
A  
ch

on

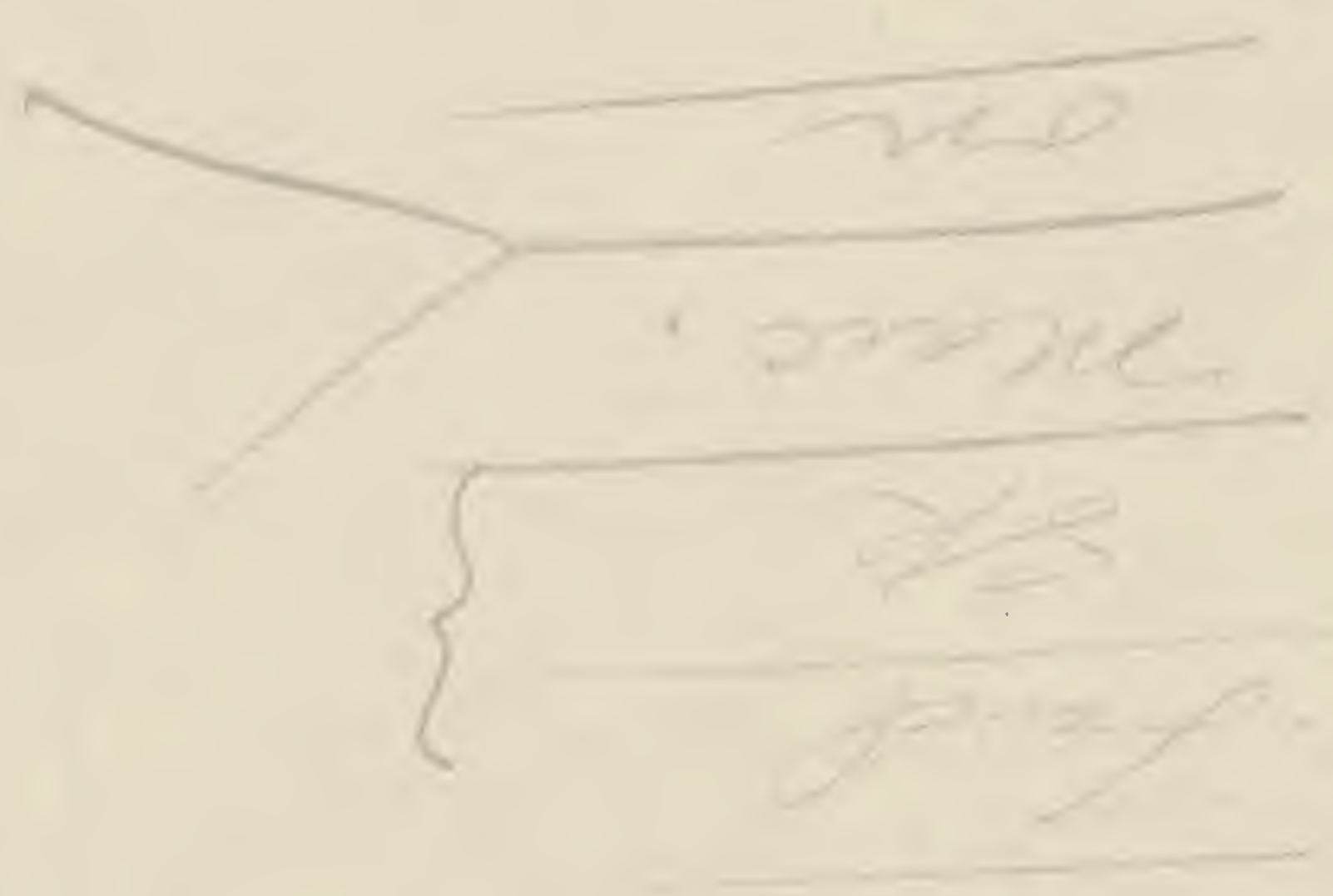
Above contorted beds come  
finer harder flat bedded rock  
of Stony Hollow member. Strike of  
hard layer N7°E 7°NW.



$\frac{108}{62}$   
 $\frac{176}{96}$   
 80

$\frac{81}{2}$   
 $\frac{049}{1}$   
 26

$\frac{496}{2}$   
 $\frac{992}{248}$   
 1240



$\frac{540}{520}$

$\frac{575}{496}$   
 79

log

$\frac{161}{496}$   
 $\frac{496}{79}$

80



Large calcareous concretions <sup>1684' 1/4</sup> in upper part of Bakoven from 200 paces to 231. Cephalopods and small snails in hard bed at A. Layer above A is composed of sooty & gray shales.

Contact of Stony Hollow & Bakoven comes at 496' in stream. Contact here suggest a great unconformity because of contortion of strata at top of Bakoven.

Stony Hollow bed extends up stream to crossing of road & stream at about 580. ~~Barometer here gave 565.~~ Barometer gave 575' on a knoll about 30 yds W of road where highest exposed beds were seen. These contained Dechenella and are probably from 10-30' below top of Stony Hollow. At 540' fossils were found in Stony Hollow bed.

A26<sup>8</sup> - Steep bank showing soft dark shales and beds of ss from 6" to a foot thick, typical lower Mt. Marion above hard bed. Dip 6° ~~W~~ W

A26<sup>9</sup> - Top of hard bed forming a terrace 20' above road. Found A. spinosa in bed. Specimen not saved.



115

A 26<sup>10</sup> Thick cut in Mt. Marion beds  
with nodular ledges in stream  
bed about 3' thick and 10' sandy  
shale above. cln Nodular beds  
Nyassa, Sp. acuminatus? Sp. 2 sp.  
Possible equivalent of High (Great  
Falls). Dip ~~2°~~ 2° S 14° W. P. flabellum.  
T. carinatus, C. coronatus.

A 26<sup>4</sup>— Under bridge at Alcove—  
at bottom section 5' heavy-  
bedded ss. in 3 layers separated by  
thin sandy shale. Then 8' shaly  
ss followed by 5' heavy bedded ss,  
the upper 3' with storm-roller  
structure. Above this 4' platy ss  
with its upper 2' having storm roller  
structure. cln 5' of ss at middle  
of section comes layers of big  
Camarotoecia. This may correspond  
to starfish layers at High falls.  
Dip 2° 55° W. Heavy-bedded storm  
roller ss. extends upstream under  
bluff on S side creek.



August 27

1C86

116

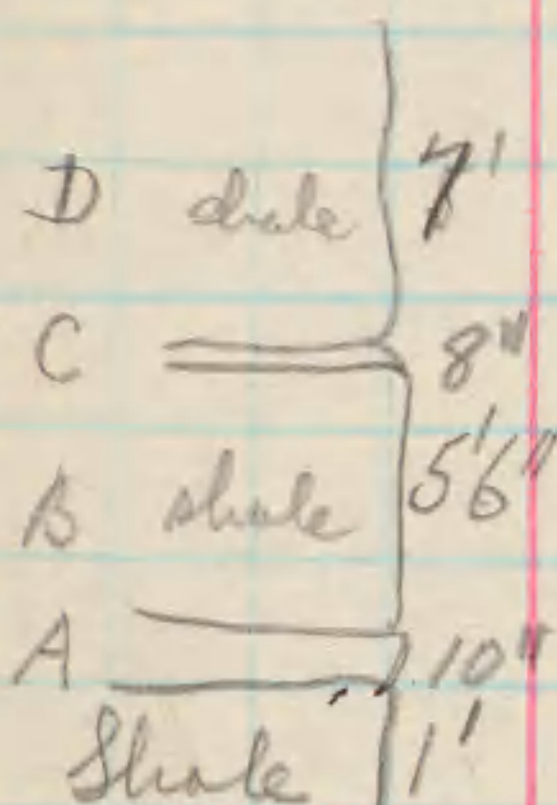
Quarry 1 mile S of Westerlo

A - Hard sandy layer 10" thick containing Schizophoria, Nyassa, Sp. n. sp.

B. - Dark blue gray shale with many fossils: Paracyclas, Orthonata,

C. Calcareous bed with Atrypa & Schizophoria

D. - Dark greenish shale with Orthonata. Saw no Schizophoria



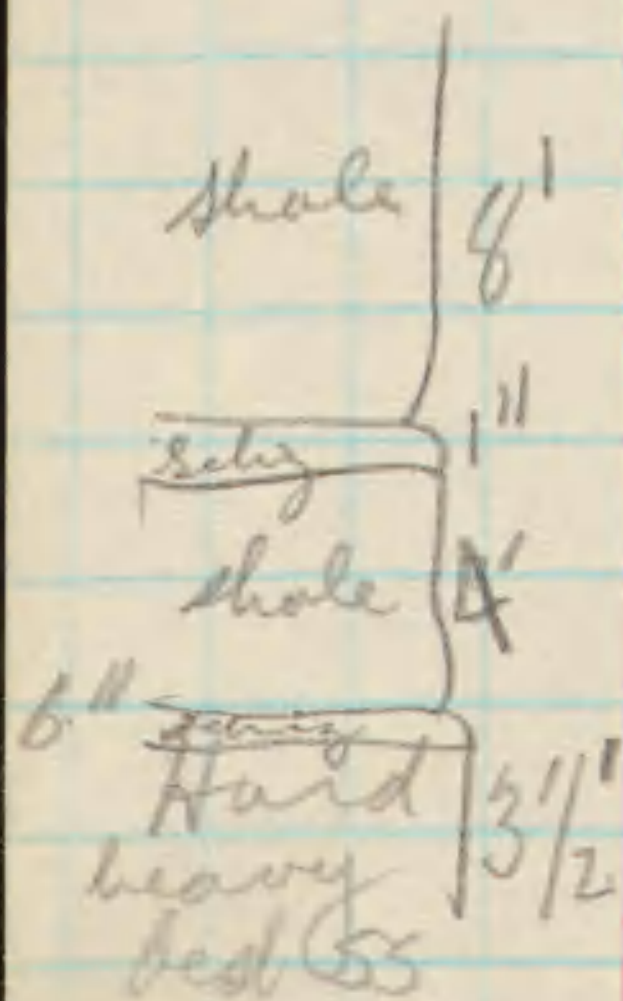
in Q. 1/2 mile S. of Westerlo

A 27' - About 20-30' of shale exposed in banks of stream. At base above 1' hard ss is calcareo-arenaceous layer about 8" thick containing many Microspira. Possibly same layer as ~~A 27~~. These beds at A 27' are below the Schizophoria. C. coronatus also common here

A 27<sup>2</sup> - At about 1070 A.T. hard or lower Schizophoria bed appears in road gutter. About 3' above it comes another zone of Schizophoria and above that

Strike on hard layer N 22° W 90° W. This is probably a local structure.

Schuchertella is plentiful here with the Schizophoria in the lower bed. Suggests layer at Kingston.





1686a





A27<sup>3</sup> - Quarry in sandy 1087  
and thin ss flags containing 117  
Microspira, C. coronatus +  
Camarotoechia rare. Dormanville

A27<sup>4</sup> - About 40' falls over  
alternating sandy sh & flat ss  
layers with storm-roller bed  
forming falls. Dickinsons falls

A27<sup>5</sup> - Borrowing pit in soft dark gray  
crumbly, sandy shale

A27<sup>6</sup> - About 25-30' lumpy sandstone  
& mudstone.

A27<sup>7</sup> - Onondaga exposed from  
here southeast to Cedar Grove School

A27<sup>8</sup> - Black Bakoven shale

A27<sup>9</sup> - Shaly lumpy, dark gray ss with  
a small Chonetes.




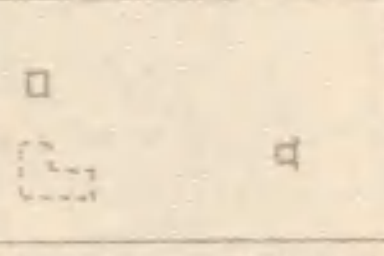
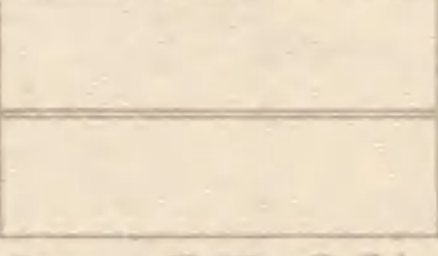


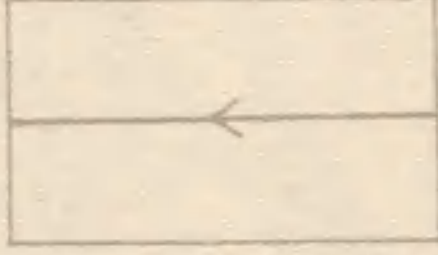
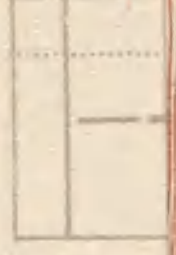








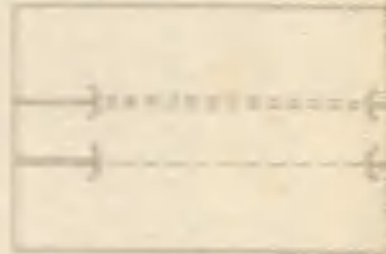
A27<sup>10</sup> - Deep gully in thin bedded  
sandy shales that break down into  
thin flakes. Between thinner &  
thicker layers of these shale come  
ss. flags. Near the head of the  
glen the ss become heavier bedded  
and thicker forming a falls over  
hard thick layers. Stony Hollow bed  
probably broken into several hard  
beds in this region, which do not



1687a

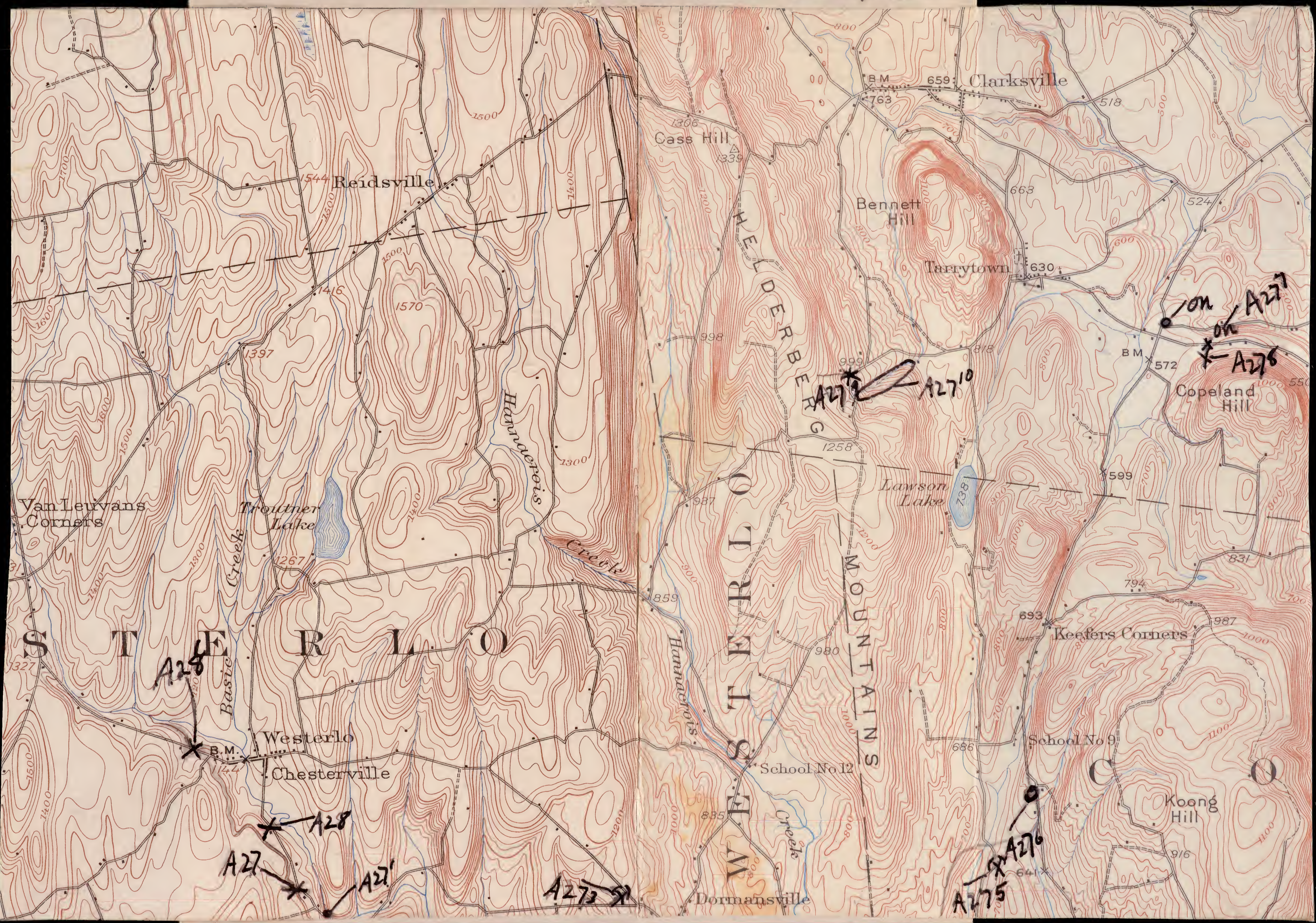
in the eastern Alaska has been  
ales of  $\frac{1}{125,000}$  and  $\frac{1}{250,000}$ .  
a surveyed, and the resulting

500'

		
Wharves	Breakwater and jetties	Bridges
		
Cliff dwelling	Good Public road	Poor Private road
		
Canal with lock	Canal lock (point upstream)	U.S. tow section and recovery
		
Cemeteries	Church, School, College (distinguished on recent maps)	Water (printed in blue)
<b>RELIEF</b> (printed in brown)		
		
Contours (showing of water in blue)	Depression contours	Marsh
		
Spring Well	Aqueducts or waterpipes	Aqueduct tunnels



1687a





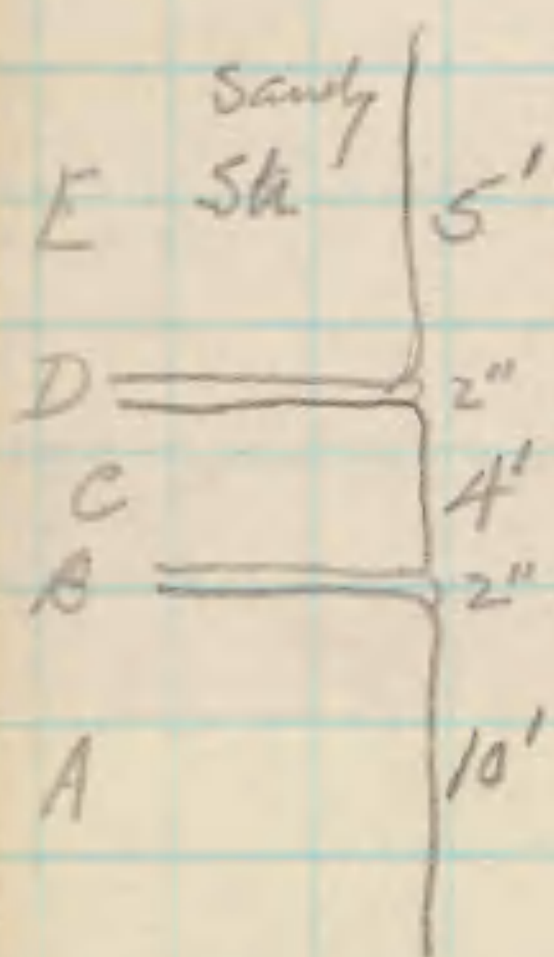
14  
90  
1260  
800

2060'

1688.118

strongly affect the topography. 118  
August 28

A28 - Small quarry in rocks not far under *Schizophoria* bed. Under this quarry are 2' of hard ss. which form a flat. The *Schizophoria* bed runs along the road as a ridge on the west and cuts west of the quarry at A28.



A28! - A - 10' sandy shale with thin ss flags, capped by 2' hard ss with upper bed knobby somewhat calcareous. Just above this is 2" sandy knobby bed with *Schizophoria*. The lower bed of A27.

C. - About 4' shale with *Orthonota*

D. - 2" bed with *Nyassa*, *Schizophoria*, *Schuchertella*, *Atypa* (same as mid *Schiz.* zone)

E. 5' + dark shale with *Orthonota*

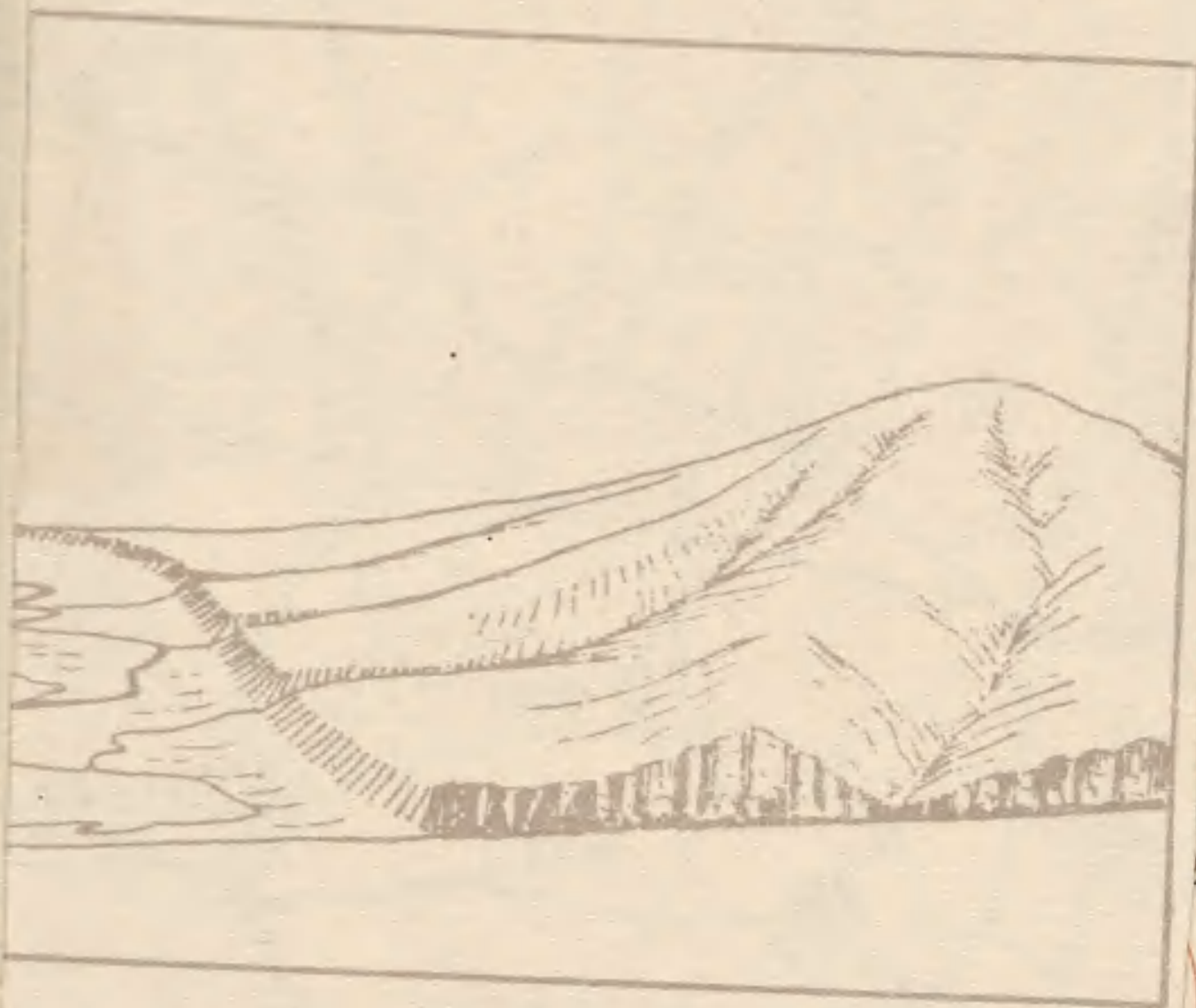
A28<sup>2</sup> - Coral bed at approximately 1240' A.T. Below it comes sandy dark shales of Landiff type containing sandstones flags up to one foot thick. Coral bed formally and lithologically seems to be the same as the bed at Mt. Marion.

About 15' above coral bed and for 10' + *Sp. andaculus* is common. *Athyris* also occurs. This also checks with the Mt. Marion locality. This *Sp. andaculus* bed is 10-15' thick. Above it fossils are rare



1688a

...rains, and valleys, as well as  
 ...r lines that are far apart on  
 ... lines that are close together  
 ... that run together indicate a  
 ...r lines express altitude, form,  
 ... below.



valley that lies between two

...e particular area mapped.

Surveys of areas in which t  
 ...ic importance, such as most o  
 ...its tributaries, are made with  
 ... publication of maps on a sca  
 ..., with a contour interval of 10

Surveys of areas in which  
 ...ic importance, such as much  
 ...n of Arizona or New Mexico,  
 ...he northwest, are made with s  
 ... publication of maps on a sca  
 ...s) or  $\frac{1}{250,000}$  (1 inch = nearly 4 m  
 ... to 250 feet.

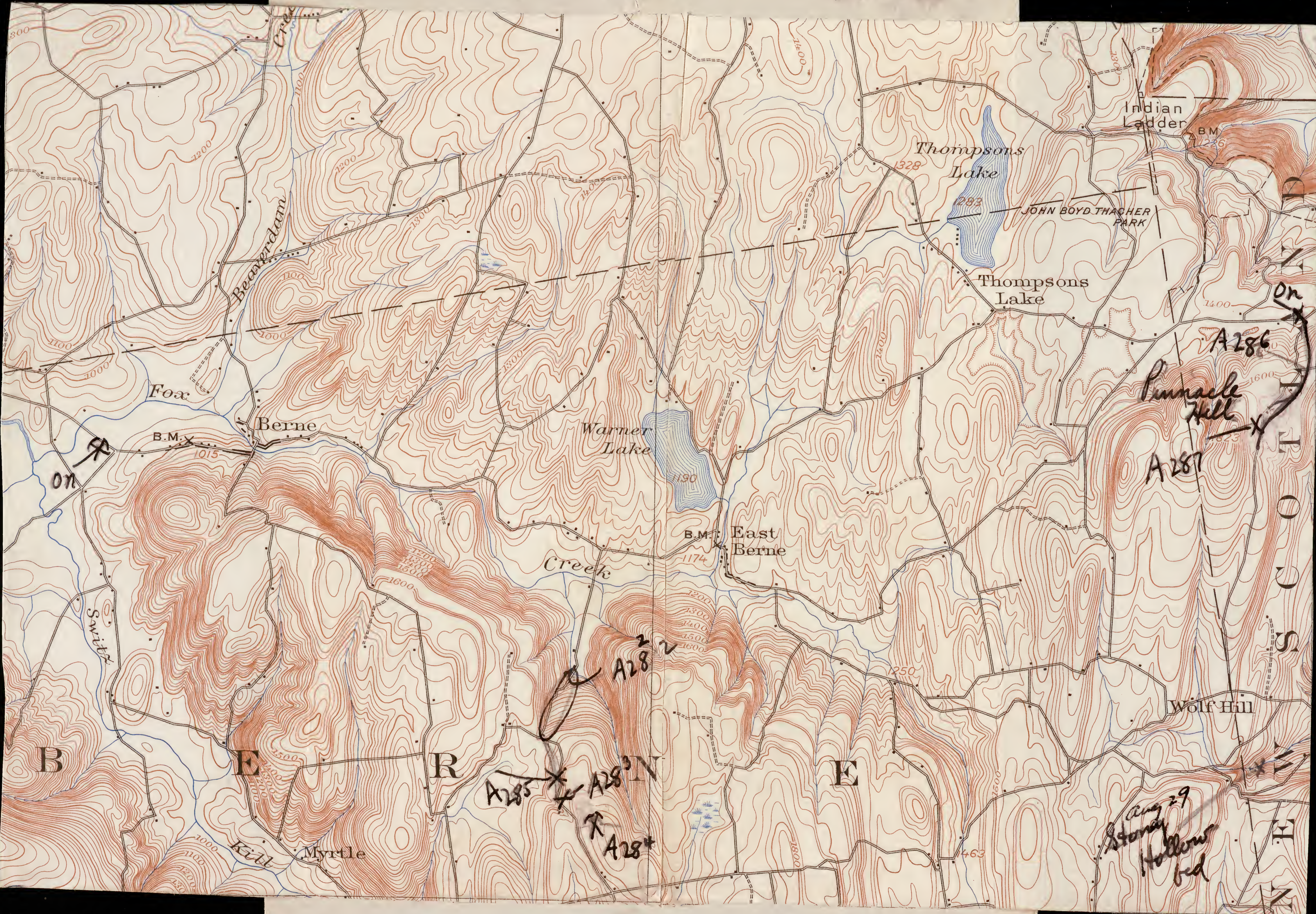
...he aerial camera is now being  
 ...mation recorded on the pho  
 ...h show only drainage and cult  
 ...in the United States. By th  
 ...ratus, aerial photographs are u  
 ...regular topographic maps, w  
 ...age and culture.

...topographic survey of Alaska  
 ..., and nearly 44 percent of its  
 ...at 15 percent of the Territory  
 ...scale of  $\frac{1}{500,000}$  (1 inch = nearly  
 ...inder of the area surveyed th  
 ...of  $\frac{1}{250,000}$  (1 inch = nearly 4 mil  
 ...ar economic importance, cover  
 ...maps published are on a scale o  
 ...rger. In addition to the area

...11,200 square miles of

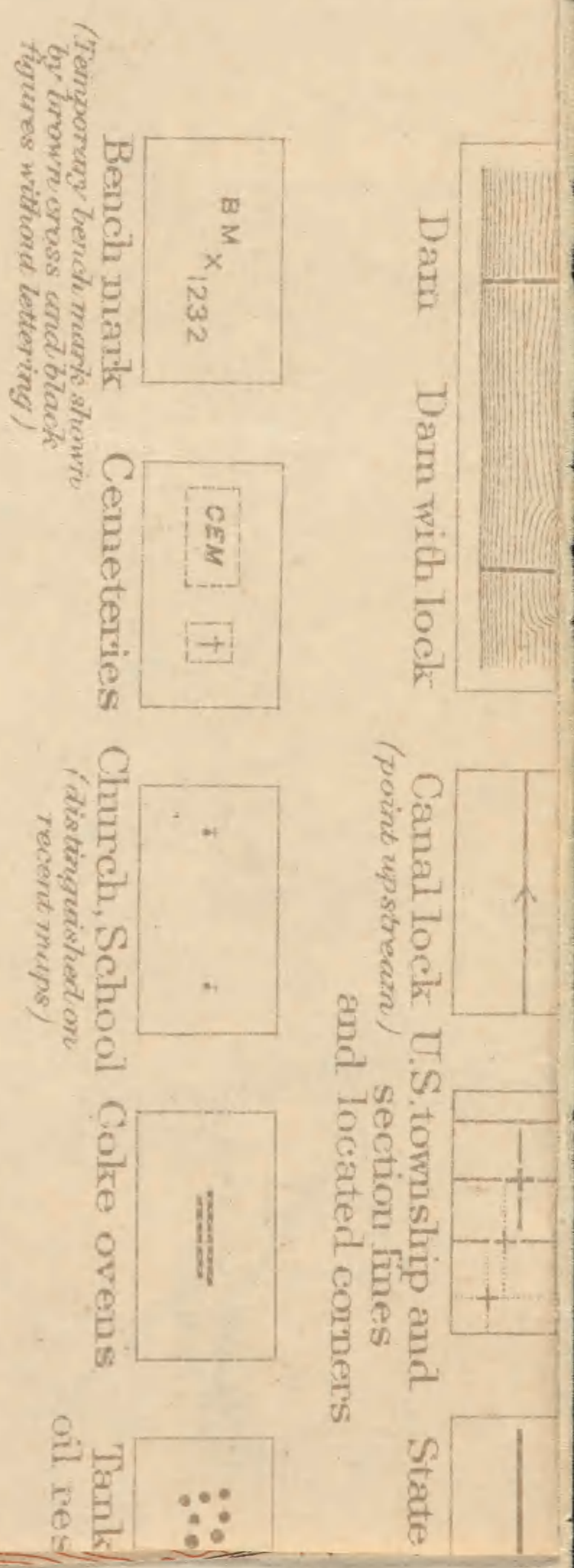


1688a





16886



# RELIEF

(printed in brown)

sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{31,680}$  (1 inch = one-half mile), with a contour interval of 1, 5, or 10 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{62,500}$  (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{125,000}$  (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since



16886



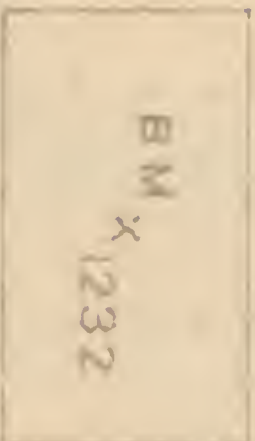
Dam Dam with lock



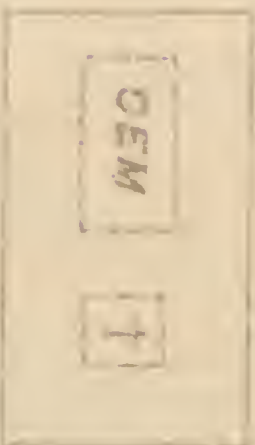
Canal lock U.S. township and section lines  
(point upstream) and located corners



State



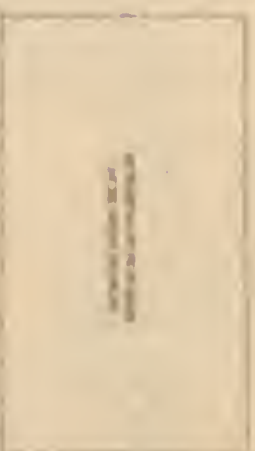
BM x 1232



CEM



Church, School



Coke ovens



Tank

Bench mark

Cemeteries

Church, School

Coke ovens

Tank

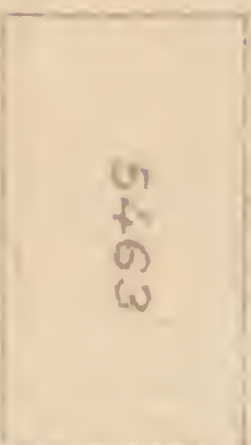
(Temporary bench marks shown by brown cross and black figures without lettering)

(Distinguished on recent maps)

oil res

# RELIEF

(printed in brown)



5463

Figures

(showing height above mean sea level instrumentally determined)



Contours

(Contours showing depth of water printed in blue)



Depression contours



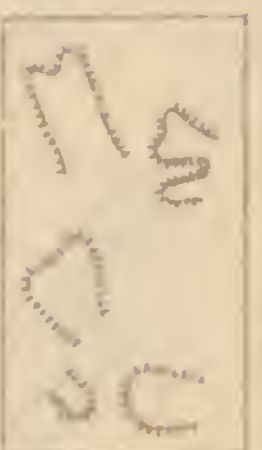
Level



Wash



Cliffs



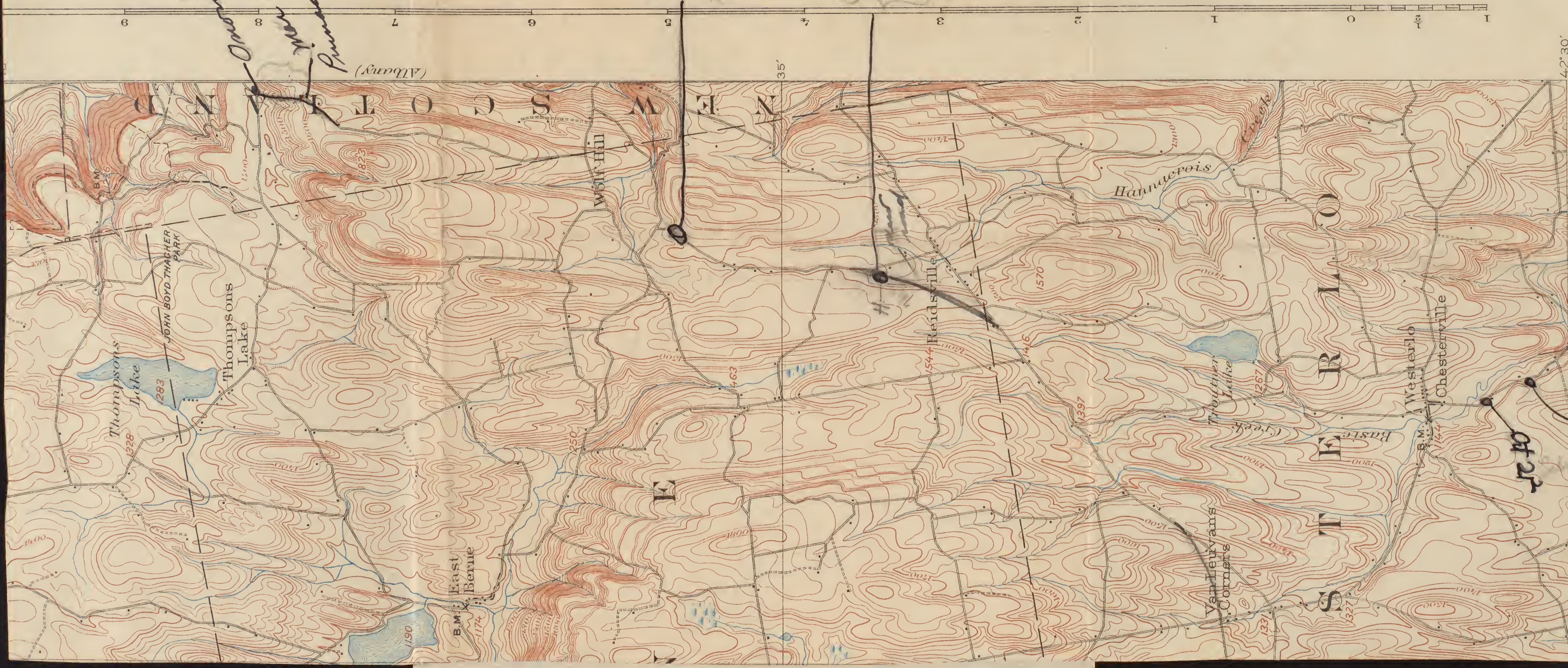
Mine dumps



Tailings or mining debris

(or shown by contours)





Oct 21  
Pumelle Hill

Oct 21

16886

Oct 21

4 Miles

meters

Edition of Sept. 1903, reprinted 1928.  
Polyconic projection, North American datum

42° 30'  
74° 00' (Cassackie)

BERNE, N.Y.

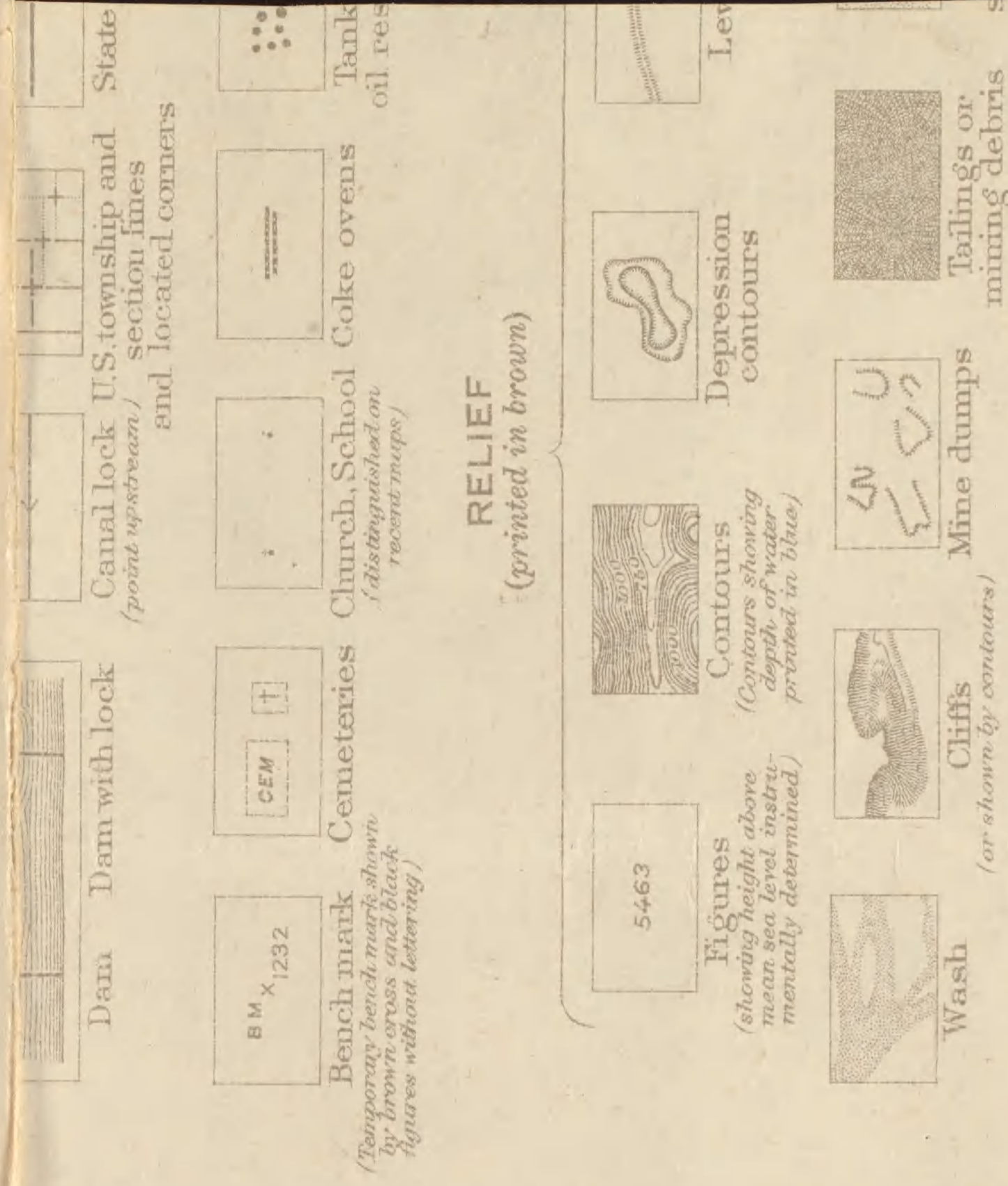


sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{31,680}$  (1 inch = one-half mile), with a contour interval of 1, 5, or 10 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{62,500}$  (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

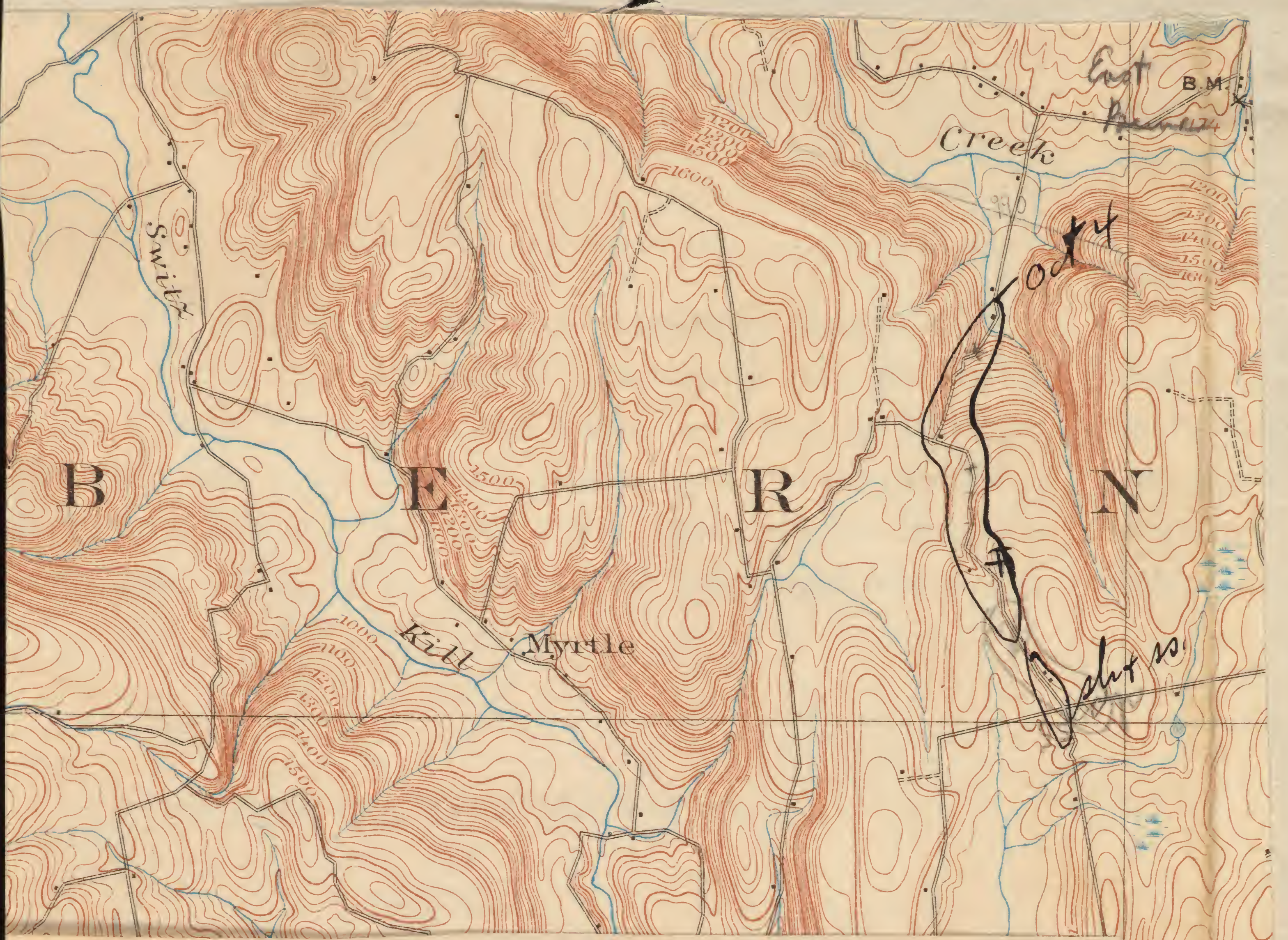
3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of  $\frac{1}{125,000}$  (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since





1688c



RESERVOIRS

QUALITY

Levee

Sand and sand dunes

Intermittent Lake

Glacier

Spring

Streams

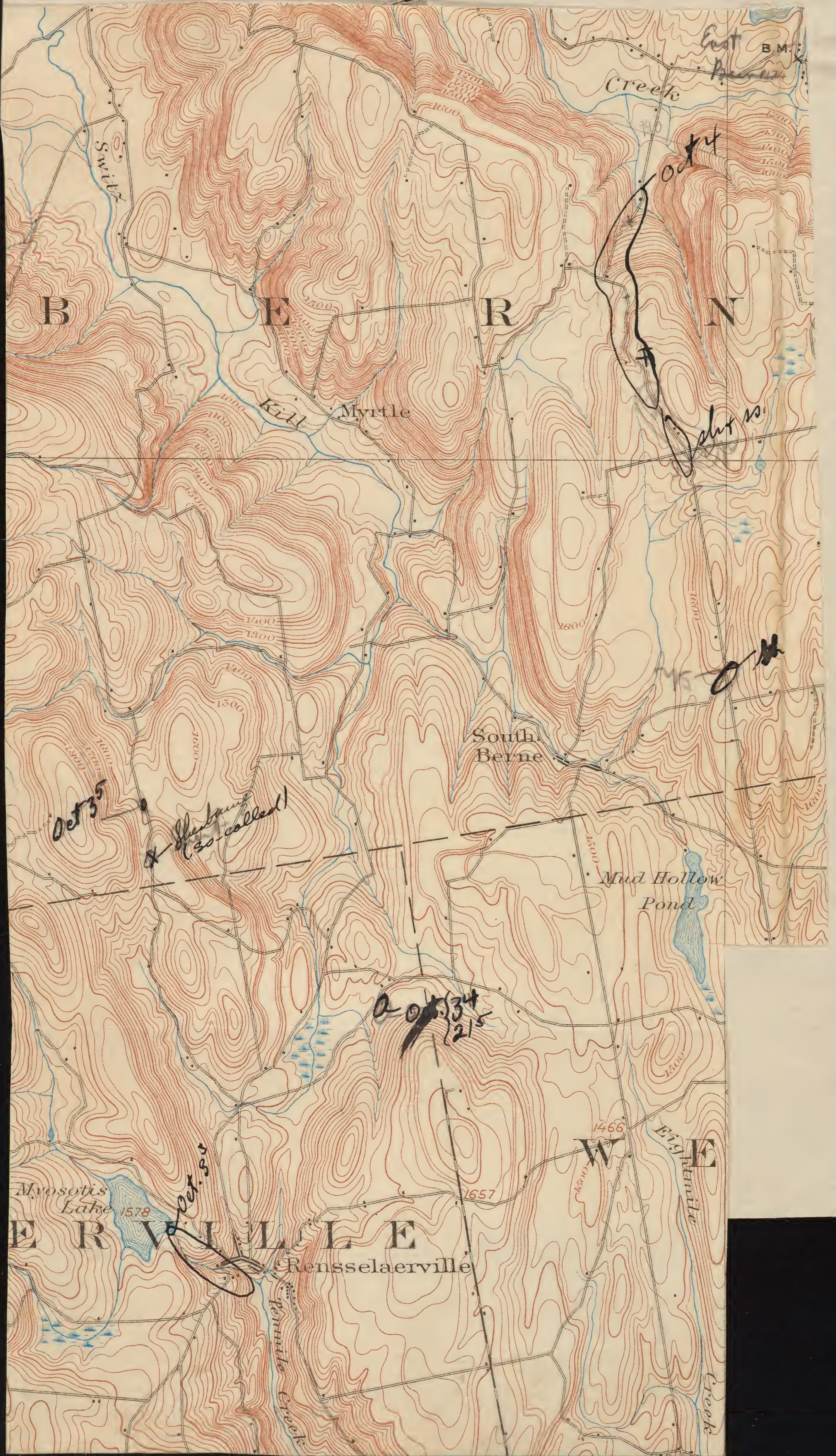
Falls and rapids

Intermittent streams and ditches

(or shown by contours printed in blue)



1688c





1689

A283 - New cut in heavy bedded shaly ss. with large *Tropidoleptus* *Camartocchia*, fossils scarce

119

A284 - Qy above East Berne section

A285 - Thin-bedded ss of Colgate type. *Macrozoinifer*, few fossils

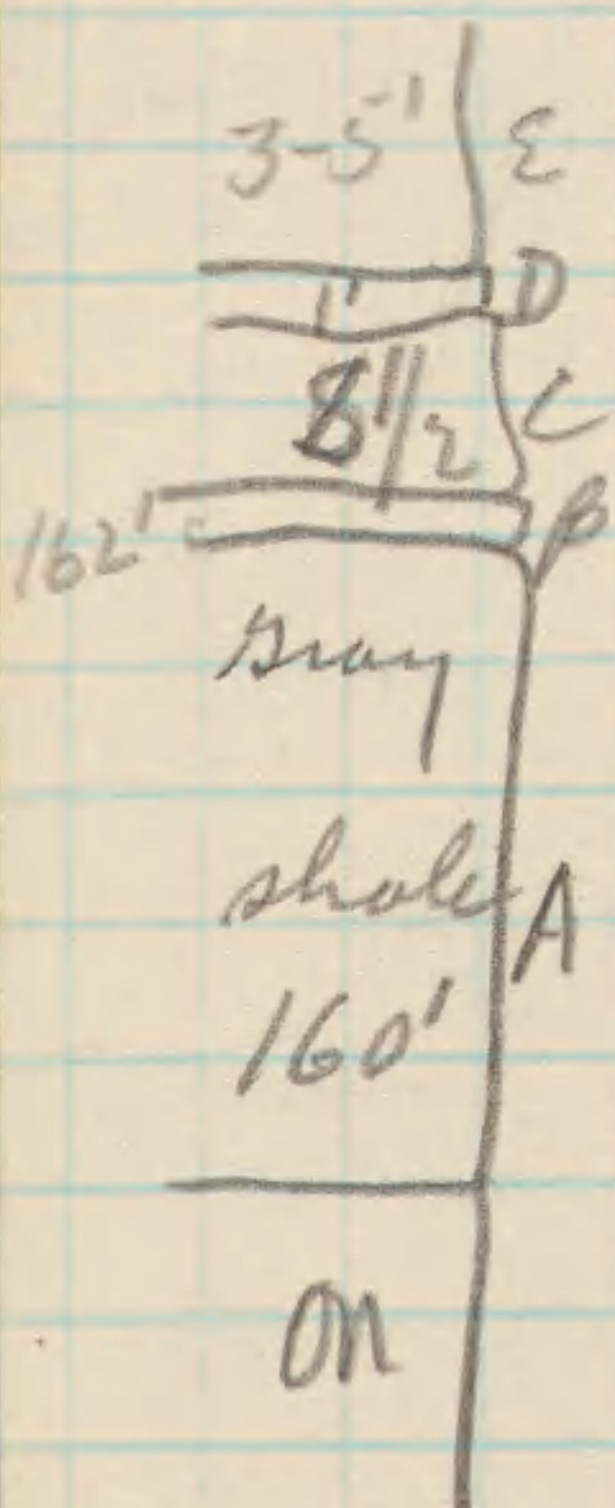
A286 - Pinacle Hill

A Onondaga in field at base hill where road forks to go uphill. 160' aneroid reading above road comes a thin limestone. Between Onondaga + 1st thin limestone are dark gray shales with white streak & weathering to ash gray. They contain many small fossils particularly *Paracardium*.

B - 3" limy ss. with scattered *Holopea* or *Macrocheilus*

C - gray sandy sh. 8 1/2" heavier bedded than A & coarser

D - 9" - 1' of hard blue gray crinoidal limestone. Just at contact of limestone and bed below *Dechenella* and small *Pentamerella* occur. Fossils in the ls. are rare. Weathered pieces from C contain a few small fossils.





E. - 3-5. calcareous gray shale  
with ~~beds~~ limestone bed at  
top containing Ceratopora 120

A787 - Borrowing pit in coarse  
sandy shale about 5' overlaid  
by 6-7" heavy ss. bed. Over  
this come 10' crumbly sandy  
dark gray shale. No fossils seen.

Aug 29

Section on the Onondaga -  
Wolf Hill section

Section starts at bridge on Onondaga  
which continues upstream for  
356 paces. At 356 paces and for  
95 paces (to 451 paces) a low sag  
of the Onondaga brings in the  
basal Marcellus, and the  
following section

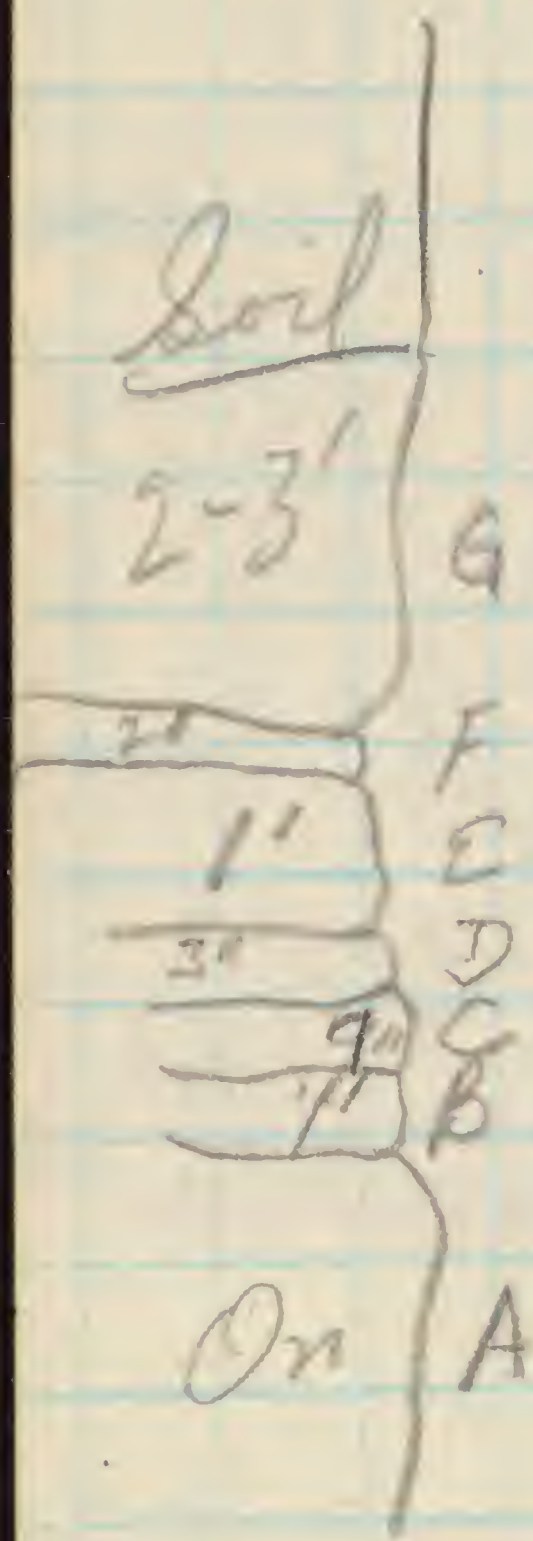
A - Onondaga

B - calcareous dark shale with  
Styliolina

C. Limestone 7" inches with the  
upper 2' shaly and containing  
smooth Spinfers and Leptocoelia

D - 3" shaly limestone with  
Styliolina

E. - sandy shale 1'





1691

F - limy shale, black 2' *Styliolina*  
G - sooty shale with paper  
thin cleavage 2-3' 121

451-595 paces Onondaga  
exposed in stream bed. At  
middle of this interval  
Onondaga some 4' above  
stream. At end of Onondaga  
exposure the base of the  
Marcellus is not exposed

<sup>250</sup>  
595- 845 paces opposite school

845-1045 - covered

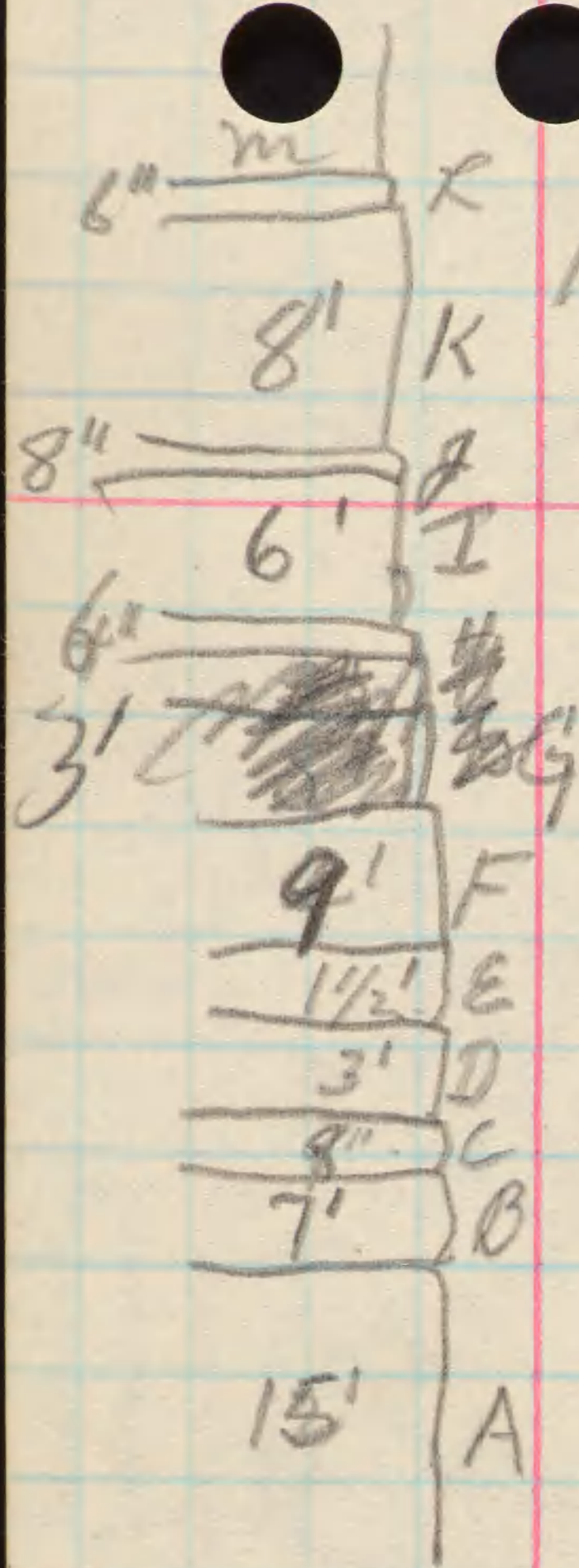
1045-1528 bank of dark  
gray fissile shale 20-30' high  
Exposures nearly continuous. At  
1528 a large concretion 4' across  
1528-1628 - same dark shale. At  
1628 a 5' falls over a hardened  
contorted zone at base and one  
at top of falls.

1528-1821 - Continuous exposures  
1821 comes another contorted zone

1821-1839 same

At 1839 two large concretions  
on each side stream with  
1" calcareous bed tying them  
together. Fossils common.





1839 - 2007 - base of falls  
 Falls of Onesquetham

1692

122

A - Dark shales with clams & snails about 15'.

B - Thin bedded ss containing pyrite nodules. 7'

C - hard massive ss. layer with pyrite nodules. 8"

D. Firm sandy shale with pyrite and small calcareous nodules scattered thru it. 3'

E. Calcareous sandstone & interbedded shale. Palaeonils. & pyrite 1 1/2'

F. Calcareo-arenaceous shale and in 6" harder bed containing harder & softer layers. Ampelurus  
 G - 8" hard limestone, gray & line  
 H - 9"

I. - 3' Gray & line ls. interbedded with sandy shales. Upper bed 8" - 10" thick & forming flat in stream & upper bed of falls

Basal ls bed of H. 8" thick gray & x line. Middle ls. bed 6" thick abounds in Ceratopora Upper ls. smooth blue gray contains Strophalosia



215'

1245  
1000



H - 6" shaly sandy stone 1693

I - Soft dark crumbly shale 123

J - 55 flag 8"

K - Soft crumbly shale 8'

L - 28 flag 6"

M - crumbly sh to soil

Falls covers horizontal interval of about 25' and upper limestone beds extend in low arch 125 paces upstream. At 250 paces above falls comes a 15' falls in dark gray shale capped by a 9" ss bed. Upstream from brink of falls at 1245'. At top of falls strata are topog. level and these beds are 10' thick. Above them on each side of stream strata are horizontal & about 50' thick of alternating sh & sandy sh & ss flags like Sherburne. At end of section we saw in a small gorge with strata dipping strongly downstream.

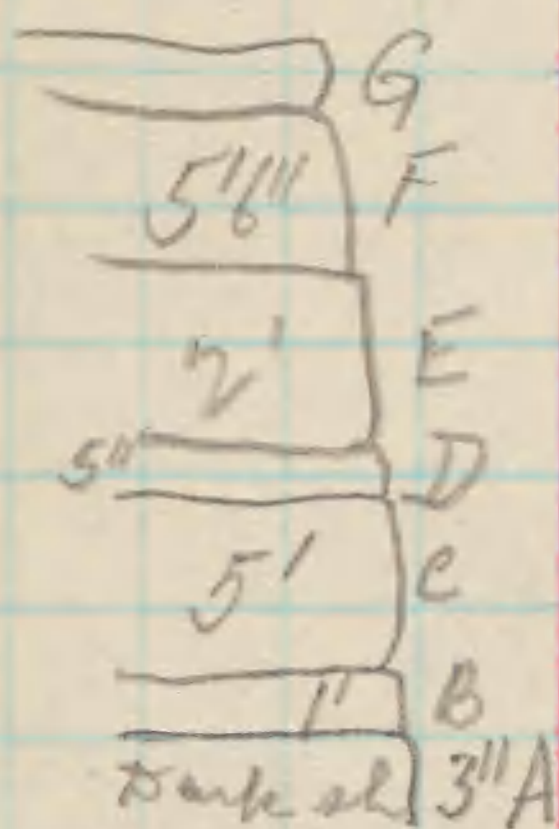


August 30

1694

124

A30 - Cherry Valley at Stony Creek  
B. 80 paces upstream from road  
and 54' by aneroid comes a ledge  
of shaly dark gray limestone about  
1' thick. Under this ledge are a  
few inches of dark shale. Also  
the lower part of the limestone  
occurs small brachiopods, ostracods  
& clams and a snail like that  
occurring at the base of the  
in the 15' of shale below the  
hard bed on the Onesquehant.



C - covered 5'

D - 5" gray shaly ls. with ostracods  
N 2° E 2 1/2° W

E - 2' platy, thin bedded shale  
weathering a brownish gray.

F - Covered 5'6"

G - 2' dark shale

Aug 30'

Rhipidothyrus beds lens out laterally  
under x bedded ss with plants.

Oak Hill Estheria occur just above  
lowest olive beds under the bridge  
in lower 6" of black shale



Aug 31

1695

125

Section up Steenberg Mtn.

1360-1380 green crumbly & mottled red & green rocks with Ostracods about 10' from top.

1380-1403 - X-bedded ss.

1403-1421 - Covered

1421-1432 - Red, green & dark sh & ss

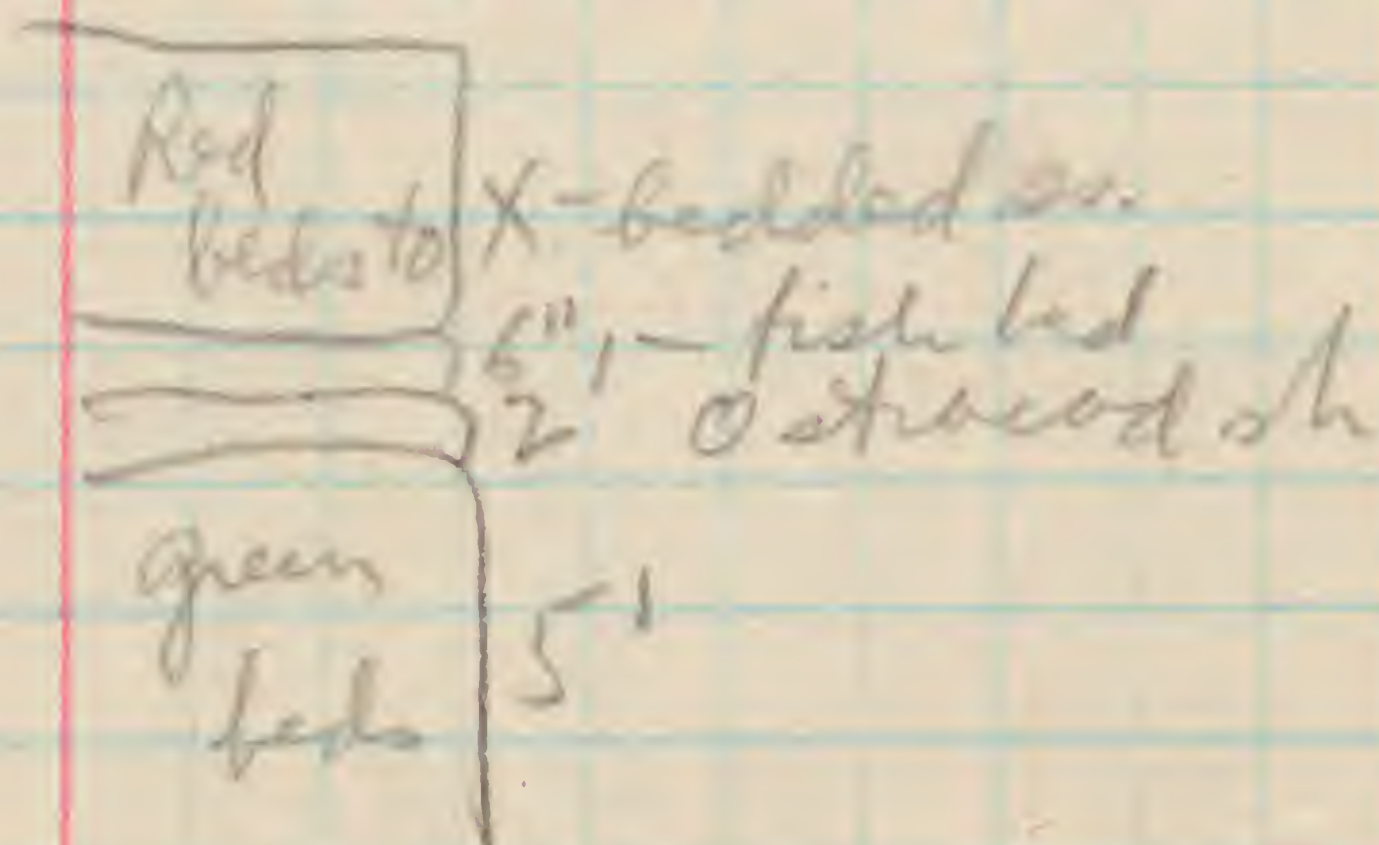
1432-1460 - Covered

1460-1470 - X-bedded red weathering ss & green sh.

1470-2135 - mostly covered

2135-2145 - X-bedded ss with *Protolapidodendron*, *Eospira* spp. May be same as quarry above East Windham. Possibly beds from which Danton's sp. *Disperma* came.

Section at 1360









Washburn A27  
Grand Falls A15



1568

## THE TOPOG

The United States Geological Survey is making a standard topographic atlas of the United States. This work has been in progress since 1882, and its results consist of published maps of more than 40 per cent of the country, exclusive of outlying possessions.

This topographic atlas is published in the form of maps or sheets measuring about  $16\frac{1}{2}$  by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for any quadrangle depending on its nature, and its probable future development, and consequently though the standard atlas sheets are of nearly uniform size they represent areas of different sizes. On the lower margin of each sheet are printed graphic scales showing distances in feet, meters, and miles. In addition, the scale of the map is shown by a representative fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale  $\frac{1}{62,500}$  means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 similar units on the earth's surface.

The standard scales used on these maps are multiples of the fraction  $\frac{1}{62,500}$ . Quadrangles in thickly settled or industrially important regions are mapped on a scale of  $\frac{1}{25,000}$  or

Jg 312